

JOURNAL

OF THE

AMERICAN VETERINARY MEDICAL ASSOCIATION

GENERAL ARTICLES

- Experimental Bovine Traumatic Gastritis—*B. W. Kingrey* 477

SURGERY AND OBSTETRICS

- The Administration of General Anesthetics to the Horse and Ox—
E. Wynn Jones 484
- Herniorrhaphy and Intestinal Anastomosis in a Gelding—*D. D. Delahanty* . 488
- Fracture of Radius and Ulna in a Dog—*W. E. Blake* 489
- Large Urinary Calculus in a Dog—*M. K. Anderson and Vytas P. Rastas* 490
- Preparation of a Canine Skeleton—*Charles W. Titkemeyer* 491
- The Stifle Shoe in Equine Wound Healing—*Charles H. Burger* 493
- Surgical Intervention in Intestinal Lymphosarcoma in Two Cats—
Donald F. Patterson and Hans Meier 495

CLINICAL DATA

- Elaeophoriasis in Sheep—*Rue Jensen and Lee Seghetti* 499
- Erysipelas Vaccine Avirulent (EVA)—A New Agent for Erysipelas Control
—*C. W. Gray and Carl J. Norden, Jr.* 506
- The Occurrence of Rhabditis Strongyloides in Association with Dermatitis
in a Dog—*Carl F. Schlotthauer and Paul E. Zollman* 510
- Pathology of Rinderpest—An Abstract—*Maurer—Jones—Easterday—
DeTray* 512
- Symposium on Granulomatous Diseases—Part 2—*Jones—Morrill—Jungherr—
Sautter—Steele—Henry—McEntee—Smith—Benbrook—Cordy—
Runnells—Stubbs—Mcgrath—Sholl—Cole* 526
- Bovine Stephanofilarial Dermatitis in Illinois—*Norman D. Levine and
C. C. Morrill* 528

NUTRITION

- The Effects of Feeding and Implanting Estrogenic Substances in Ruminants—
Dennis D. Goetsch 531

EDITORIAL

- The Today and Tomorrow of Veterinary Research 534

(Contents continued on adv. pages 2 and 4)

Volume 127

DECEMBER 1955

Number 945

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*Gray, C. W., Norden, Carl J., Jr.: Erysipelas Vaccine Avirulent (Eva)—
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CONTENTS

(Continued from Cover)

SURGERY AND OBSTETRICS

Prolonged Gestation in Cattle	490	Use of Vasectomized Rams	494
Viral Infertility in Cattle	494	Cruciate Bovine Monstrosity (illus.)	498
Prolonged Cross-Circulation in Dogs	494	The Opossum's Gestation Period	498

CLINICAL DATA

Tularemia in Sheep	505	Tuberculosis of Avian Type in Cows	514
New Disease in Young Brook Trout	511	French Molt in Budgerigars	514
Formalin for Foot Rot in Sheep	511	New Growth Standards for Dairy Cows	514
A Case of Equine Infectious Anemia	511	Bovine Rabies Without Negri Bodies	530
Sodium Nitrite Poisoning from Oil	511	Brucellosis from Animal Contact	530
Tuberculosis in Cats	514	Hog Cholera Biological Products	530
Tuberculin Testing of Children	514	Vesicular Stomatitis Virus Carriers	530
Resistance to Tuberculosis	514		

OFFICERS: Floyd Cross, *President*; Brigadier General Wayne O. Kester, *President-Elect*; J. G. Hardenbergh, *Executive Secretary*; H. E. Kingman, Jr., *Assistant Executive Secretary*; H. E. Kingman, Jr., *Treasurer*.

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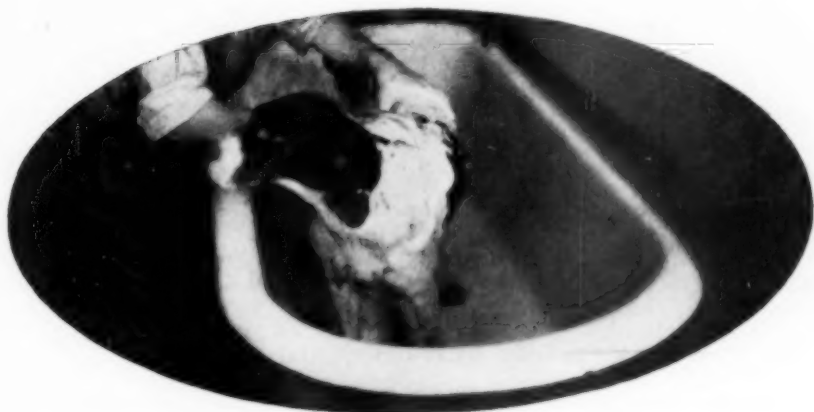
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CONTENTS—Continued

NUTRITION

Zinc Deficiency and Parakeratosis	533	Cottonseed Meal in Poultry Rations	533
---	-----	--	-----

EDITORIAL

Thoughts on Equine Abdominal Surgery .	535	Congratulations to Veterinary Medicine ..	535
--	-----	---	-----

CURRENT LITERATURE

Eructation in Adult Cattle, 536; Immunization of Mink Against Clostridia, 536.

FOREIGN ABSTRACTS

The White Blood Cell Picture in Cows, 536; Purification of Tetanus Toxoid, 536.

THE NEWS

Enrollment in Veterinary Medical Schools, 1955-1956	537	Women's Auxiliary	540
Equine Practitioners Association to Meet in Chicago	537	Applications	542
News from Washington	538	U. S. Government	544
World Congress on Fertility and Sterility .	539	Among the States and Provinces	544
Conference on Mucosal Diseases of Cattle	539	Foreign News	553
Student Chapter Activities	539	Veterinary Military Service	554
		Births	555
		Deaths	555

MISCELLANEOUS

Reports—Conferences Held During AVMA Meeting—Continued, 482.



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Veterinary Medical Activities

◆ Dr. J. A. McCallam and Dr. Frank A. Todd attended the meeting of the American Medical Association Council on National Defense held in Washington, D.C., Oct. 26, 1955, and presented a Status Report on Civil Defense Activities of the AVMA.

★ ★ ★

◆ Editor-in-Chief Aitken attended the meeting of the U. S. Livestock Sanitary Association held in New Orleans, November 16-18.

★ ★ ★

◆ AVMA Councils and Committees meeting in Chicago during November and early December included: Council on Education, November 19-20; Special Committee on Insurance, November 22; Research Council, November 27; Scientific Exhibits, November 27; Laboratory Animals, November 27; Veterinary Supply Problems, November 28-29; Motion Pictures, November 30; Academic Standards Board, December 1; and Public Relations, December 2.

★ ★ ★

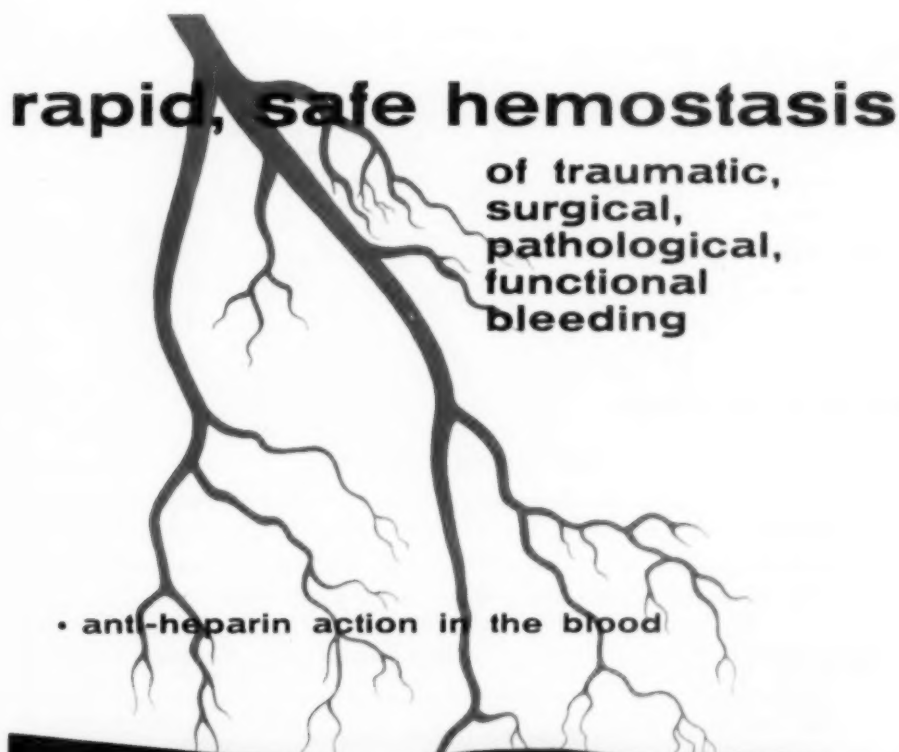
◆ The Section Officers (Committee on Program) responsible for the Scientific Program for the 1956 annual meeting to be held in San Antonio, Texas, Oct. 15-18, 1956, met in that city on October 31 and November 1. Present were H. E. Kingman, Jr., chairman, Committee on Program; Dale K. Sorensen, chairman and G. D. Stallworth, secretary, Section on General Practice; Lloyd Ferguson, chairman and R. A. Packer, secretary, Section on Research; Wade Brinker, chairman, and Norman L. McBride, Jr., secretary, Section on Small Animals; M. S. Hofstad, chairman and L. C. Grumbles, secretary, Section on Poultry; A. R. Roseberg, chairman, and Fred C. Neal, secretary, Section on Surgery and Obstetrics; Robert L. Hummer, chairman, and D. J. Dean, secretary, Section on Public Health. Walter Lawrence of R.C.A. and John Jewett of Pitman-Moore Company met with the Section Officers to assist in planning the closed circuit television portion of the program.

★ ★ ★

◆ Assistant Executive Secretary Kingman attended the annual meeting of the American Meat Institute held in Chicago, November 11-15.

★ ★ ★

◆ Lt. Colonel Norbert A. Leshner, V.C., U.S.A.F., now stationed in England, represented the AVMA at the ceremonies, on Oct. 20, 1955, dedicating the new veterinary school at the University of Cambridge. The dedication ceremonies were honored by the presence of Queen Elizabeth and the Duke of Edinburgh.



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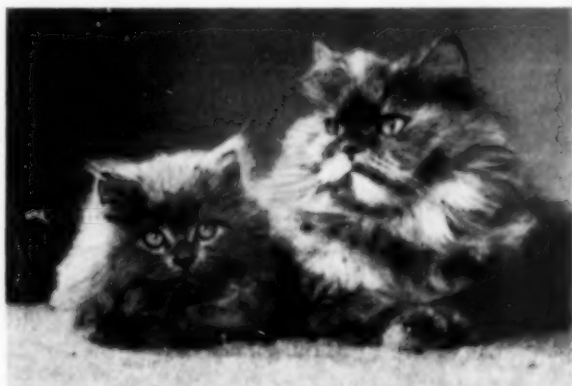


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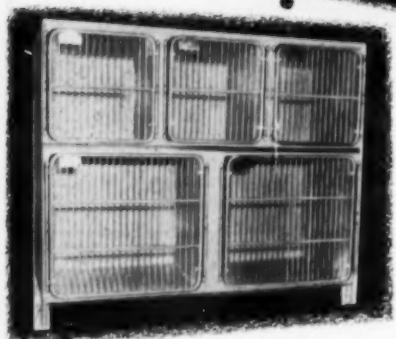
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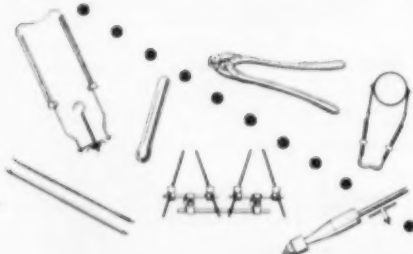
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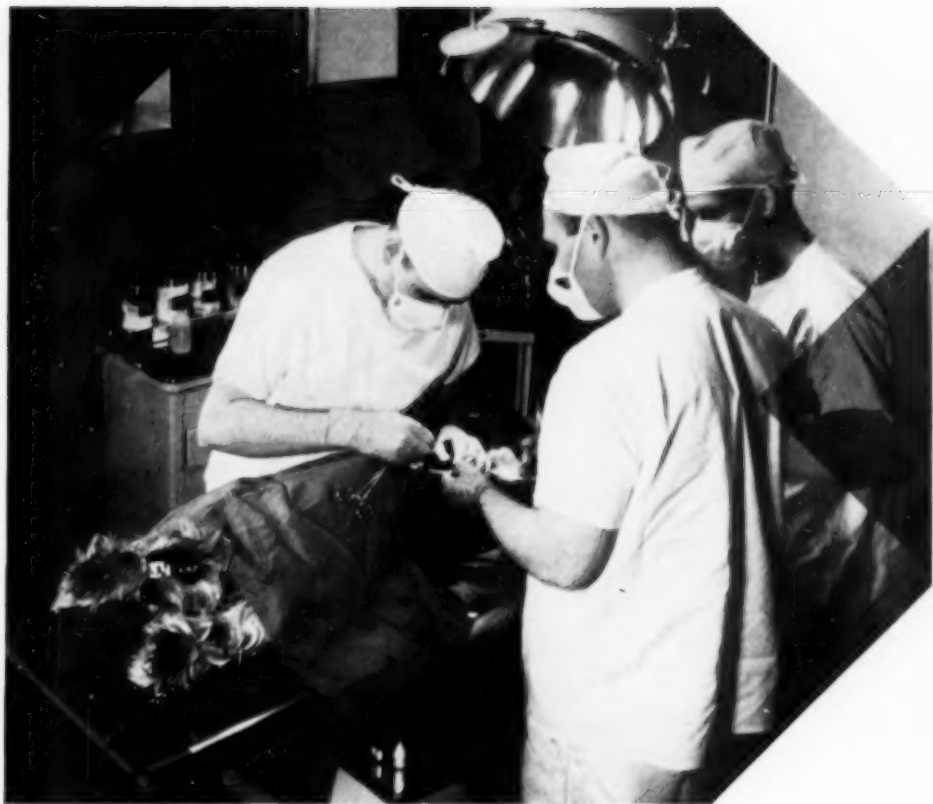
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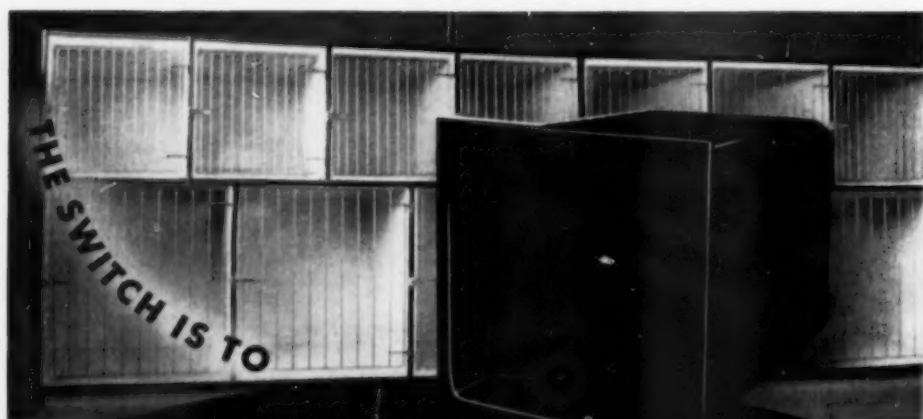
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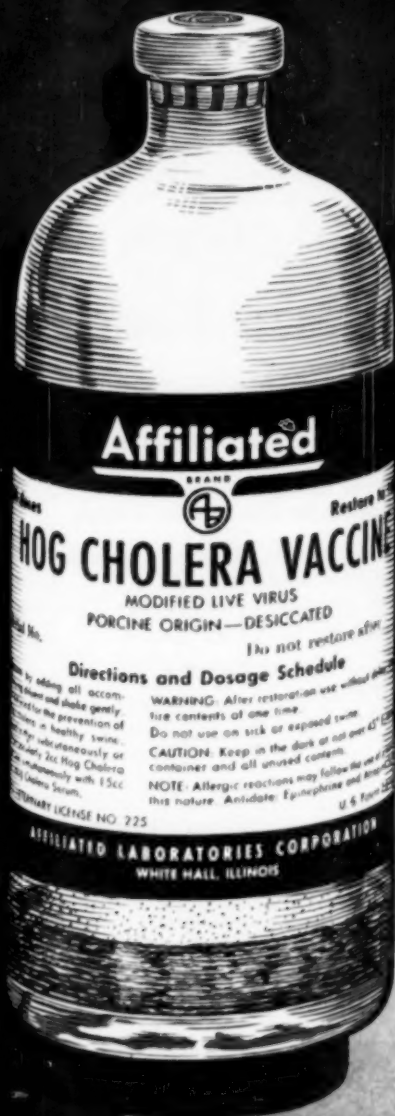
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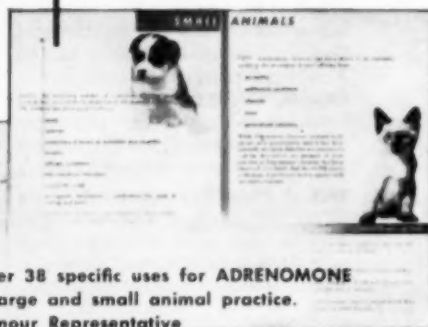
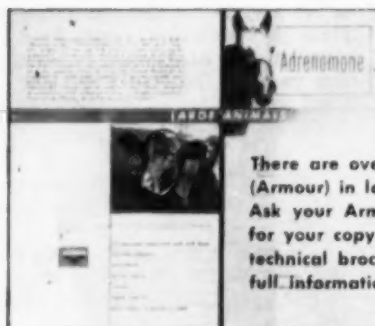
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Experimental Bovine Traumatic Gastritis

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Ames, Iowa

THE PROBLEM of traumatic gastritis in cattle arises because of the indifferent manner of prehension, mastication, and deglutition of the animal, together with the peculiar anatomical arrangement of the gastric apparatus. With the advancement of animal husbandry has come the increasing tendency to maintain cattle under stable conditions and on dry feeds for longer periods during the year. This fact, coupled with the mechanization of agriculture and consequent increase in metallic debris, seems to be causing an increasing number of deaths due to traumatic gastritis each year.

The annual death loss is but a part of the loss suffered by the cattle industry. A number of the affected animals survive, but often are no longer profitable because of poor lactation, poor weight gains, or loss of reproductive ability.

In recent years, surgical removal of the foreign bodies has been increasingly popular among veterinarians, the consensus being that favorable outcomes are especially dependent upon early diagnosis.

In an effort to further clarify the clinical syndrome of this condition in the early stages, 10 healthy cows were made available in December, 1953, for study by the Iowa State College Veterinary Clinic.

METHODS AND MATERIALS

The experimental animals were maintained under circumstances very similar to actual field con-

ditions during the entire course of the experiment.

For four days, the animals were given physical examinations and blood studies were made twice daily in order to establish a norm for each animal. Then two pieces of baling wire, 2.5 and 3.5 inches long, were each sharpened on the end, while the other end was made into a loop 0.5 inch in diameter to prevent the wires from escaping through the wall of the reticulum. One 8-penny nail was also well sharpened and these three objects were enclosed in a gelatin capsule especially fashioned to contain their lengths. Inert powder was used to fill the capsule to give it additional weight. One of these capsules was administered with a balling gun to each animal, after which an examination of certain features was made five times daily until after the effect of these metal items became apparent, and then twice daily for two days. Approximately forty-eight hours after the initial symptoms of foreign body injury were detected, a rumenotomy was performed to remove the foreign bodies.

To establish the average normal readings, the first of the twice-a-day readings of all 10 animals were averaged, then the process was continued for each type of examination for the first five days.

RESULTS

The onset of symptoms developed, on the average, thirty hours after the ingestion of the foreign bodies. To establish the average reaction of the group, the first readings after the apparent onset of symptoms were averaged, then the second readings, and so on until the entire postoperative observation period was covered.

Surgery was performed on an average of forty-eight hours after the onset of symptoms, so the graph was prepared accordingly. The resulting graph (chart 1) presents a somewhat different aspect than the individual charts which demonstrated the

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tuations from one reading to the next in many of the features. However, the averages for the 10 cows show a general trend without marked fluctuations.

The temperature reaction indicates a significant feature, the average reading being above normal for nearly three days after signs of injury. The highest point was reached within eight hours and then began a gradual return to normal. This may be

of significance in determining the stage of the disease.

The heart rate began to accelerate with the onset of symptoms and continued to increase for twenty-four hours, at which time it began to subside although it remained above normal until the time of surgery. Interestingly, this feature did not conform closely to the temperature curve even though both are indications of a febrile reaction.

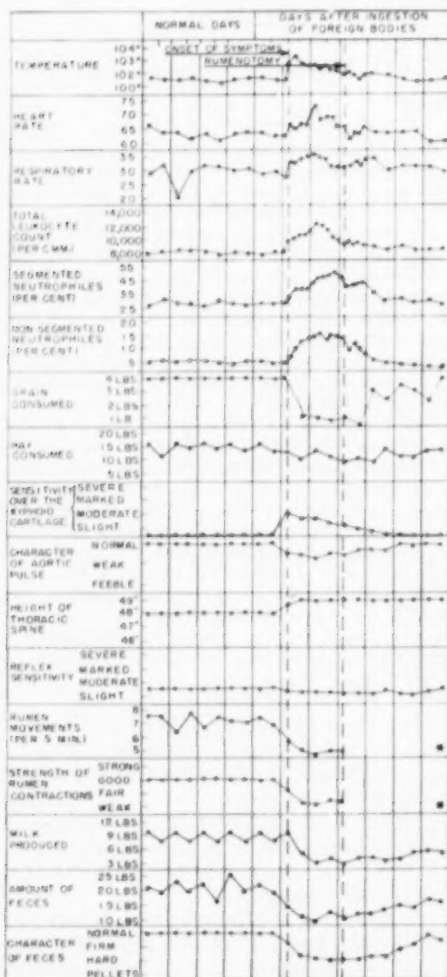
The respiratory rate definitely increased slightly during the period of illness, but since individual animals showed wide variations, even when normal, an occasional examination of the respiratory rate would be of limited diagnostic value.

The total leukocyte count began to increase immediately with the onset of symptoms and continued to rise for twenty-four hours. It remained near this high point for about six hours and then began to decline. The first 24-hour period of the decline was marked, but there then was a tendency to level off at a slightly above normal reading for the duration of the study. The surgery may have been a factor in preventing the return to normal, although even before surgery that tendency was suggested.

The percentage of segmented neutrophils followed a pattern very similar to the total leukocyte count, although the highest readings came twelve hours later in the course of the disease and the decline came more slowly. The return to normal limits did seem to have been completed within the period of study, however.

The percentage of nonsegmented neutrophils increased, in general, in direct proportion to the total white blood cell count and to the percentage of segmented neutrophils. The return to normal developed slightly earlier than the other two features and then dropped slightly below normal for the last two days of the study.

In view of the reactions demonstrated by these three features of the blood study it would seem that they are consistent and should be considered significant findings in suspected cases of traumatic reticulitis. Since each of these readings was subject to variations, even occasionally returning to near normal on individual animals, it would seem that all three features should be routinely examined. Even though one feature might be within normal limits at a particular time, it is likely that one or both



*The rumen movements were not recorded after surgery because of the surgical wound in the left paralumbar fossa.

Chart 1—Average readings of 10 normal cows and readings after onset of signs of traumatic gastritis.

of the others would disclose a significant disturbance.

An evaluation of the appetite, as indicated by the amount of grain consumed, is a significant and simple part of the examination. A marked decrease in the appetite for grain persisted, on the average, until a day after surgery. After the appetite began to improve, it was marked by occasional lags and apparently was only returning to normal at the time the study was terminated.

The hay consumed during the illness was somewhat less than normal but under field conditions such a slight decrease might be difficult to detect. Thus, an affected animal receiving only hay might seem to have a normal appetite.

An increased sensitivity of the area over and around the xyphoid cartilage was present, on the average, within the first few hours of the onset. From this point, there was a gradual decline over a period of four days until the sensitivity was again normal. However, had the foreign bodies not been removed, it is probable that this early return to normal would not have occurred, although there was a definite indication that the sensations were becoming less severe by the time of surgery.

The character of the aortic pulse was disturbed to a slight degree, on the average, a decrease in the strength of the pulse wave coinciding with the development of the other symptoms. This disturbance persisted for four days but, on the average, was not great. While this weakness was sufficiently pronounced to be easily recognized in a few animals, it could not be considered as being among the most reliable clinical findings.

The height of the thoracic spine was recorded by measuring, on a standard, the distance from the top of the back to the floor. The reading was made at a point about 6 inches posterior to the dorsal tips of the scapulae. Individual animals showed variation from day to day but the average of the group demonstrated a 1-inch rise occurring within twelve hours and then persisting throughout the period of study. From this, we might interpret that the elevation of the spinous processes of the thoracic vertebrae is a quite constant feature although the degree may not be marked.

In the examination of reflex sensitivity,

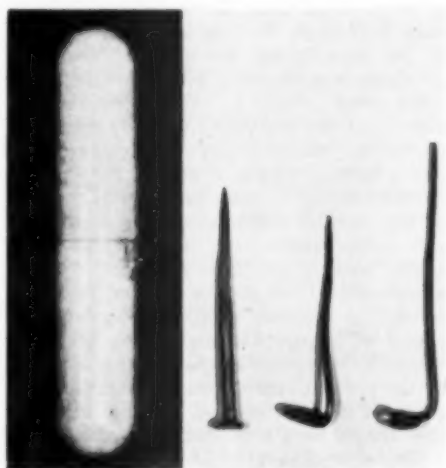


Fig. 1—Gelatin capsule given to each cow to induce traumatic gastritis, and the three foreign bodies it contained.

the blunt point of a writing pencil was rested lightly against the skin beginning at a plane drawn through the anterior border of the proximal end of the scapula and extending to the middle of the paralumbar fossa. The degree of skin twitching was noted. In none of the animals was there an increase in sensitivity and 2 animals indicated a decrease. The average findings represent a disturbance so light that this diagnostic feature would seem to be of limited significance.

The rate of rumen movements showed considerable variation among the normal readings (4.0 to 11.0, ave. 7.5, per 5 minutes). This rate was promptly slowed with the beginning of symptoms and became progressively slower for the following twenty-four hours. Even though there were wide deviations in the normal readings, the over-all average indicates that there is likely to be sufficient disturbance associated with the disease to be of diagnostic significance.

The strength of rumen contractions was disturbed in nearly direct proportion to the disturbance in rate. Certain individuals showed readings in which only one of these two features was definitely abnormal but it appears that, on the average, the deviation from normal is likely to be concurrent in the two features.

The amount of milk produced was prompt-

ly diminished with the advent of illness. Only 5 animals were lactating at the time of the experiment, but each of these individuals was similarly affected. The lowest point was reached within twenty-four hours and, by the time the study was completed, the volume of the averages had made only a partial return to normal. This would appear to be a valuable clinical feature in the lactating animal that is not available in the examination of the dry cow.

The amount of feces excreted was diminished early in the disease and remained below the normal limits throughout the period of study. Although there was considerable variation in the amount excreted by the normal animal, the average decrease was sufficiently marked to indicate that this should be a consistent disturbance.

The character of the feces was altered much in proportion to their amount. The smaller the amount the more abnormal the consistency. While certain individuals at times discharged only small, hard, equine-like pellets, the average animal evacuated larger but abnormally hard masses for five days after the onset of symptoms.

DISCUSSION

The purposes of this experiment were: (1) to attempt to evaluate the significance of the symptoms usually associated with traumatic gastritis, (2) to search for abnormal changes that would indicate the stage of the disease, (3) to identify any clinical features that had not yet been reported relative to the condition, and (4) to ascertain the results of surgical removal of the offending foreign bodies after a delay of approximately forty-eight hours.

The results with these 10 animals indicated that there are frequently variations in the clinical picture among different animals and even in 1 animal at examinations only a few hours apart. On the other hand, there was a remarkable uniformity in the symptoms evident in the group and in their general trend throughout the disease.

Certain of the features would show an occasional return to normal during the disease. Because of this it would seem that the diagnosis should be based upon the composite findings rather than on any given symptom.

It has been reported that pressure upon the spine posterior to the withers from both sides, or picking up the skin over it,

may induce groaning. This procedure was repeated at regular intervals on the experimental animals with no reaction from certain of the normal animals (60%) but severe discomfiture to others. With the advent of illness each animal gave the same response it had given prior to illness.

The urine was regularly examined for changes in pH, the presence of albumin, and the presence of ketones. These findings were entirely negative with the exception of 1 cow which showed a positive ketone reaction occasionally, both before and during illness.

It has been reported that trembling of the posterior scapular muscles had been noticed in many cases. This feature may undoubtedly be associated with traumatic gastritis but none of the experimental animals demonstrated it, so apparently it is not a very constant symptom.

Frequent swallowing has also been reported to be a significant sign of traumatic gastritis. This behavior was not detected on any of the experimental animals but 3 did show excessive salivation for approximately the first thirty-six hours of illness. These same 3 animals held their heads in an extended position, giving the impression of suffering from internal pain.

It has been reported that the affection exceptionally begins with gagging or vomiting through the mouth and nose. This was not evidenced by any of the experimental cows, although the author has encountered this behavior occasionally in field cases of traumatic gastritis.

From an over-all perspective, the findings of this experiment substantiate many of the reports on the symptomatology of field cases, while being contrary to others. This may be true because of certain instances of mistaken diagnosis on field cases and because a number of the field cases are studied in the more advanced stages of the disease.

Of the 30 foreign bodies that were administered, 25 were found in the reticulum, three in the anterior dorsal sac of the rumen, and two on the floor of the rumen proper. Of the 25 that were located in the reticulum, 19 were puncturing the reticulum. Of these, six were found to be only partially implanted or stitched through the plicae. The remaining 13 had passed as far through the reticular wall as was possible. It happened that each cow had at

least one complete perforation. It was of interest that the nails seemed to cause the least trouble. Of the ten administered, five remained in the rumen. Of the nails in the reticulum, one was stitched through the plicae, while the others were free on the floor of the reticulum. Of the 20 pieces of baling wire ingested, all were in the reticulum and 18 were penetrating its wall. There seemed to be no distinction between the longer and shorter pieces.

All 10 animals made a complete recovery following surgery. One cow calved on the ninth day after surgery with no assistance and with no disturbance to the wound. The animals were marketed three to six months later. Although the butcher buyer was informed of the history of these animals, there was no indication of abnormality and they were bought not subject to examination. Because of the simplicity and lack of reaction to the surgery, Gentile (1951) urged that an exploratory laparotomy be included as a diagnostic procedure on questionable cases.

From these results, it would seem that if surgical removal of the foreign bodies is effected early in the course of the disease, before secondary complications have developed and before the restorative properties of the body are lost, there is good assurance that the recovery will be satisfactory. This speculation is substantiated by the report of Ryan (1947) of 100 per cent recovery on 40 rumenotomies. The author of the present report has recorded 119 rumenotomies in the field, with 115 recoveries, 2 cases of mistaken diagnosis, and 2 in which the foreign bodies were not recovered.

CONCLUSIONS

From the observations made in this study, the following general conclusions regarding traumatic gastritis may be made:

- 1) Sharpened foreign bodies when administered to cows are likely to result in signs of traumatic gastritis within three days.
- 2) These signs tend to subside after forty-eight to seventy-two hours.
- 3) Every diagnostic feature has some tendency to fluctuate, thus making a second examination of value if the first is inconclusive.
- 4) There are no pathognomonic symptoms

of the disease. Careful systematic examinations and observations of the complicated clinical picture may be necessary to arrive at an accurate diagnosis.

5) The most reliable of the many possible early clinical manifestations would seem to be: elevated temperature, neutrophilia, disturbed appetite for grain, pain in the area of the xyphoid cartilage, suppression of milk flow, atony of the rumen, and constipation.

6) It would seem that the most important clinical manifestation for differential diagnosis is the presence of pain in the area of the xyphoid cartilage, since most of the others are present in other common febrile disturbances.

7) The symptoms presented by the experimental animals were more moderate than those usually reported on field cases, indicating that mild cases may frequently be overlooked.

8) If surgical removal of the foreign bodies is accomplished within approximately forty-eight hours from the onset of symptoms, it is possible to anticipate nearly 100 per cent recovery.

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Reports — Conferences Held During AVMA Meeting — Continued

American Association of Veterinary Anatomists

The Association of Veterinary Anatomists held its annual meeting August 16 at the Leamington Hotel, Minneapolis, during the AVMA convention. Dr. Ralph Kitchell of Minnesota presided and there were 26 members from 16 schools in attendance.

President Kitchell outlined the plans for a symposium in veterinary anatomy which was held at the University of Minnesota subsequent to the AVMA meeting.

Dr. D. R. Peterson, secretary, distributed a summary of the annual questionnaire which was then discussed.

Considerable time was spent discussing the textbook situation in histology.

Officers elected for the ensuing year were: Dr. J. A. McCurdy, Washington State College, president; Dr. D. R. Peterson, Oklahoma A. & M. College, president-elect; and Dr. A. A. Price, Texas A. & M. College, secretary-treasurer.—*D. R. Peterson.*

Veterinary Examining Boards

The Conference of American Examining Boards was held at the Hotel Lexington on August 15. It followed the preconvention conference so closely that few board members attended. However, nine states were represented.

Chief among the subjects discussed were: new veterinary laws and the advisability of adapting the new comprehensive multiple choice examination that is furnished by the National Board. Some were positive their present laws would have to be modified to legally provide for it. All seemed satisfied that it covered the basic subjects thoroughly and was a most valuable tool for a licensing board to use.

It was the consensus of those present that this annual conference of state and provincial examining boards could have far-reaching benefits to the states and provinces, and that plans should be developed to establish an organization with a more permanent structure.

The present chairman was requested to continue for another year.—*Chas. W. Bower, Chairman.*

Public Health Veterinarians

Fifty-four members and interested veterinarians attended the Conference of Public Health Veterinarians on August 15 at the Hotel Radisson, Minneapolis. Brigadier General Wayne O. Kester, president, referred to the growing interest on the part of the veterinary profession in the broad public health field. Dr. James Lieberman, secretary-treasurer, outlined the objectives of the con-



Conference of National Association of Federal Veterinarians held in Minneapolis August 15 during the AVMA convention.

ference in relationship to programs of the AVMA and other associations having major or marginal interest in public health. Pending membership of the conference in the National Health Council was discussed, and a progress report was given on the status of legislation for incorporating the conference by act of Congress. Several matters relating to the requirements for sustaining membership were reviewed.

Dr. Alexander Robertson of the Royal Veterinary College at Edinburgh, Scotland, addressed the

group briefly, stating that veterinarians in the United Kingdom are focusing their attention on our progress in this field, with a view to determining the type of program that will best meet their own needs.

The regularly scheduled meeting of the conference will be held during the week of Nov. 14, 1955, in Kansas City, Mo., in conjunction with the annual meeting of the American Public Health Association.—James Lieberman, Secretary.



Conference of Veterinary Parasitologists held in Minneapolis August 15 during the AVMA annual meeting.

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

The Administration of General Anesthetics to the Horse and Ox

E. WYNN JONES, Ph.D., M.R.C.V.S.

Stillwater, Oklahoma

EFFICIENT ANESTHESIA demands maximum safety, ease of induction and maintenance, good relaxation and, in the large animal, a short recovery period. Present anesthetic techniques do not fulfill these requirements. While it is obvious that improved anesthetic agents are needed, comparatively simple corrective procedures can do much to enhance present techniques.

The factors which influence anesthetic safety may be grouped as those occurring during induction, during maintenance, during return to consciousness (immediate), and during the period subsequent to the return of consciousness. With the exception of technical difficulties, the immediate anesthetic dangers include the development of abnormalities in either the respiratory or circulatory systems. These vary in degree up to complete failure of one or both of these systems. It is, therefore, most important to detect any abnormality as soon as it appears in order that its potential danger may be assessed and the necessary steps taken to combat it.

CIRCULATORY FACTORS

Abnormalities arising in the circulatory system are more commonly seen in the horse than in the ox; those having dangerous consequences include hypertension, hypotension, and ventricular fibrillation. Other abnormalities of the heart also occur but are often not easily detected. The sudden increase of the blood pressure during the course of anesthesia is usually due to asphyxia or to the release of adrenalin.² Both are most likely to occur during induction. As anesthesia deepens, adrenalin

release is diminished. The danger from hypertension lies in the possibility of acute dilatation of the heart, especially when myocardial damage coexists. During the administration of general anesthetics to 250 horses, 4 anesthetic deaths have been attributed to acute cardiac dilatation associated with hypertension.

Hypertension and acute cardiac dilatation may occur under the following circumstances: (1) prolongation of the stage of induction, especially when this is associated with struggling and restriction of the air intake; and (2) operative manipulation while anesthesia is incomplete. In such instances, the animal will often give an exaggerated response to any stimulus. This is especially likely to occur during the use of chloral hydrate, with which no marked degree of relaxation or analgesia is apparent until true anesthesia is obtained. Similar circumstances exist when β -naphthoxyethanol is used. When this drug is administered, the animal, upon losing its equilibrium, manifests distress, respiratory dyspnea, and a spastic condition of the limbs. In addition, there is increased pressure in the jugular veins. The animal is, however, unable to respond to the stimulus of operative manipulation owing to the ascending paralytic action of the drug, although it will occasionally raise its head.

Hypertension during anesthesia is also manifested by distended jugular veins due to an increased venous pressure. This is seen especially during the administration of chloral hydrate or β -naphthoxyethanol and is often sufficient to cause a hematoma at the site of venipuncture. Due to increased muscular tone, this venous congestion is accentuated by restraint, struggling, and incomplete relaxation. Since it is partially passive in character, there is probably also some direct effect of the anesthetic upon the heart. Meyer and Middleton⁷ found, during anesthesia, a marked

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These observations were made during research carried out with the aid of the Miss Aileen Cust Scholarship (1947-1949) and also a grant from the Totalisator Trust (1951-1954). The writer is extremely grateful for the assistance provided by the clinical staff at the universities of Cornell (U.S.A.) and Bristol (England).

increase of the venous pressure coincident with increased muscular effort and altered respiratory activity of the induction phase; subsequently, a fall of venous pressure occurred and then a plateau of somewhat elevated pressure persisted throughout the period of surgical anesthesia. They observed that the recovery stage was marked by a further increase in venous pressure.

A fall in blood pressure usually results from shock, hemorrhage, a combination of the two, or heart failure secondary to anesthetic overdosage. Such possibilities should always be anticipated, especially when tissues are subjected to considerable trauma or when extensive hemorrhage is likely. On such occasions, blood or plasma substitutes should be available for transfusion.

Ventricular fibrillation is most likely to occur under chloroform anesthesia, although every anesthetic is potentially dangerous. Levy⁵ states that ventricular fibrillation can be produced experimentally under chloroform anesthesia by administering the chloroform intermittently, by causing the animal to struggle, or by administering small quantities of adrenalin intravenously during the early stages of induction. Furthermore, he states that vagal stimulation favors the onset of fibrillation. These initiating factors can be overcome by premedication with atropine sulfate, by adequate sedation prior to administration of the anesthetic, and by an efficient induction technique. An occasional death due to ventricular fibrillation does occur.

Ventricular fibrillation in experimental animals and in man may frequently be controlled and normal cardiac rhythm restored by electrical stimulation of the heart. However, every effort should be made to prevent its onset by elimination of the initiating factors.

If the heart is auscultated at frequent intervals or an electrocardiograph is taken, cardiac irregularities during anesthesia will be found quite commonly. In general, factors leading to increased cardiac work predispose the patient to the development of cardiac irregularities. Such irregularities occur under chloroform, cyclopropane, β -naphthoxyethanol, and chloral hydrate anesthesia and are probably partially due to a direct action on the heart by these drugs. The writer has observed myocardial

infarcts which resulted from the administration of β -naphthoxyethanol. These observations emphasize the importance of minimizing cardiac work during anesthesia, especially during the induction phases.

RESPIRATORY COMPLICATIONS

As for respiratory complications, concern usually results from failing respirations or complete respiratory arrest. Other complications include the aspiration of fluids into the lungs, dyspnea, and edema of the lungs. While respiratory arrest is of grave concern, it should not be regarded with the hopelessness associated with cardiac failure.

In apnea, there is every chance of re-initiating spontaneous respiration by artificial respiration unless it is secondary to circulatory failure. Overdosage of the anesthetic drug should always be considered as a cause. This usually results either from an impatience to obtain complete anesthesia, from too rapid administration without assessing the depth of anesthesia, or from the use of an unfamiliar drug. It is especially frequent when inducing anesthesia in an excitable or fractious animal, under which circumstances the anesthetist tends to hasten induction unduly.

Overdosage of the anesthetics commonly used usually causes respiratory failure prior to circulatory failure. Circulatory and respiratory failure may occur simultaneously when chloroform is used. Danger signs include shallow and irregular respirations, cyanosis, and an accelerated pulse. The surgeon should remember that he can detect cyanosis not only from the mucous membranes but also from the color of the tissues at the site of operation.

Early depression of respirations is evident when barbiturates are used. The respirations become slow and irregular in depth. Extreme slowing of the respirations (bradypnea) need not cause alarm, but it can be most disturbing to the surgeon, especially if the respiratory movements are excessive.

While temporary apnea may be produced during induction by too rapid administration of the anesthetic, it is only of a momentary nature. It is seen particularly as a result of the rapid intravenous injection of barbiturates. It may be produced intentionally in smaller animals by rapid administration of an intravenous anes-

thetic, in order to facilitate the passage of an endotracheal tube, or by overinflation of the lungs during closed-circuit anesthesia sufficient to overcome the animal's normal respiratory rhythm. Respiratory paralysis also may be induced by the administration of various relaxants such as d-tubocurarine and succinylcholine. The indications for these drugs are few at present, but the writer has found them of assistance in the repair of fractures and dislocations in the ox, and their use has been described by Booth *et al.*¹ and Stowe² as an aid to restraint in the horse. Once a safe and satisfactory technique for their administration has been established, they should materially assist major surgery by providing improved relaxation.

It is obvious that some equipment for artificial respiration is essential. For this purpose we have used large endotracheal tubes ($\frac{1}{2}$ to $1\frac{1}{2}$ in. in diameter by 20 to 30 in. in length) with inflatable cuffs, in conjunction with a Knight-Wood³ positive pressure interrupter, a modified flowmeter, and an electric blower. The endotracheal tube is inserted into the trachea, immediately after anesthesia is induced, by keeping the mouth open with a speculum, passing a small stomach tube into the trachea by hand, and then threading the endotracheal tube over the stomach tube until the cuff is within the trachea. The stomach tube is then withdrawn and the cuff of the endotracheal tube inflated. In the calf, because it is impossible to insert the tube manually, we have used a large laryngoscope, as used in man, to facilitate intubation. The endotracheal tube is used routinely in the ox in all operations requiring general anesthesia.

The passage of the endotracheal tube in cattle has been stressed, not only because it is essential when relaxants such as d-tubocurarine are used, but also because the most common complication of general anesthesia in this species, the aspiration of saliva or regurgitated stomach contents, can be eliminated by its use. The aspiration of these fluids may result in immediate asphyxia or a subsequent aspiration pneumonia. Regurgitation of ruminal fluid and contents can be minimized by restricting the water intake for 12 to 24 hours before the operation, but this increases the susceptibility of the animal to shock. Adjustment of the posture of the animal and

control of the degree of anesthesia to maintain the swallowing reflex can also reduce the danger of aspiration of fluids.

This technique has not been used routinely in the horse, in which insertion of an endotracheal tube is more difficult. Artificial respiration in the horse can be carried out by blocking one nostril, inserting a tube into the other one, and sealing that nostril around the tube. This method, using a modified bellows for artificial respiration, has been described by Rankin *et al.*⁴

Technical problems associated with the control of large animals during anesthetization are most troublesome in the horse, in which violent struggling may occur during the recovery stage or even during induction if this is unnecessarily prolonged. Struggling varies in degree with the kind of anesthetic used. It is often marked during the use of barbiturates, much less marked with chloral hydrate and chloroform, and minimal with β -naphthoxyethanol. It is also accentuated by the administration of stimulants, the use of which has been suggested to reduce the period of recovery. The writer⁵ has reported, however, that when these stimulants are used, the animal does not appear to gain its feet any more rapidly than when not used. The ox is less likely to struggle, but during recovery this animal should be propped up on the sternum with the head well below the level of the chest to insure against aspiration of saliva.

Prolonged recumbency during recovery is also a serious problem. When it is necessary to administer several maintenance doses, the tissues become saturated with any intravenous anesthetic and recovery is prolonged. Rapid variation in the depth of anesthesia or a short recovery period after prolonged administration can be achieved only by the use of a gaseous anesthetic and it is, therefore, essential to establish a satisfactory technique for the administration of such drugs to large animals. The apparatus for the administration of cyclopropane in a closed circuit⁶ approaches this goal. The use of a closed, or partially closed, circuit would be especially advantageous due both to rebreathing, with consequent economy of anesthetics, and to the generation of heat within the circuit, thus aiding vaporization when vapors are used. This type of apparatus permits rapid varia-

tion in depth of anesthesia and provides a means to artificially ventilate the lungs should this become necessary.

Finally, in prolonged recumbency and anesthesia in the ruminant, tympany of the rumen should be anticipated and preparation made to relieve it.

DANGERS OF DELAYED ANESTHESIA

Delayed anesthesia dangers (those occurring subsequent to return of consciousness) include secondary disease of the lungs and damage to the heart muscle, liver, and kidneys. Postanesthetic pneumonia, especially in the ruminant, is one of the chief dangers and is most likely to occur when the cough and swallow reflexes have been depressed or abolished. In all but light surgical anesthesia, these reflexes are abolished, in which instances precautions for the prevention of aspiration of fluids should be taken. The drugs, such as ether and chloroform, which are irritating and which are excreted via the respiratory tract, also have a local effect. Their vapor is cold and they depress the action of the cilia and cause increased salivation, conditions which predispose to aspiration of extraneous matter and, in the case of prolonged anesthesia, to breakdown of the animal's resistance to disease. German workers claim that warming the anesthetic vapor by means of a water bath greatly reduces the danger of subsequent respiratory infection.

Prolonged recumbency also may produce hypostatic congestion of the lungs. It is, therefore, important to turn the animal frequently or, if possible, to support it on its sternum during recumbency. Edema of the lungs may occur when β -naphthoxyethanol is used and may result in a chronic thickening of the alveolar walls.

In the case of the myocardium, liver, and kidneys, the degree of toxic damage which occurs as a result of routine anesthesia is uncertain. It is known that chloroform causes toxic degeneration of these organs, which may result in so-called "delayed" chloroform poisoning and death. In one series of 49 cattle anesthetized with chloroform, 2 such deaths were observed by the author. The signs included a subnormal temperature, extreme malaise, jaundice, and diarrhea. Chloral hydrate is not so likely to damage the parenchymatous organs except when used in large doses. An effort to detect liver damage in 6 horses

anesthetized with chloral hydrate, both by biopsy and by the bromsulphalein retention test, revealed evidence of slight damage in only 1 animal. This animal, which was in an extremely poor nutritional state, was given 4 Gm. of chloral hydrate per 100 lb. of body weight. Degeneration of both the heart muscle and kidney parenchyma occurs as a result of the administration of β -naphthoxyethanol. The author has found that this may persist for periods in excess of six months.

When damage to the liver or other organs is likely, it is important to consider the nutritional condition of the animal and, whenever possible, to keep it in a state of positive nitrogen balance. A high-protein ration enables the liver to resist damage due to a toxic agent; therefore, in considering preoperative starvation, it is important to remember that many animals will benefit from the feeding of preanesthetic and preoperative protein supplements. A negative nitrogen balance is most probable in animals suffering from pyrexia, anorexia, a chronic suppurative lesion, or extensive trauma.

SUMMARY

Problems concerning the administration of general anesthetics to the horse and ox are discussed as they occur during the induction, maintenance, and recovery from anesthesia. Cardiac and respiratory arrest, depressed respirations, and shock cause the gravest concern. The incidence, prophylaxis, and treatment of these conditions are discussed, apnea and its control by mechanical respiration being especially mentioned. In addition, precautions against obstruction by accumulated secretions or inhaled fluids are essential in the ox and include endotracheal intubation, the technique of which is described.

Postanesthetic complications (pneumonia and toxic damage to the heart, liver, and kidneys) are most commonly observed during chloroform and β -naphthoxyethanol anesthesia. Protection against inhalation of fluids and hypostatic congestion of the lungs reduces the danger of postanesthetic pneumonia.

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Herniorrhaphy and Intestinal Anastomosis in a Gelding

D. D. DELAHANTY, D.V.M., M.S.

Ithaca, New York

A 4-year-old American Saddlebred gelding was admitted to the large animal clinic of the New York Veterinary College on March 21, 1955, for the repair of a hernia in the right scrotal region.

History.—One year prior to the above admission, an attempt had been made to remove two cryptorchid testes. At that time, only the left testicle was removed. The first admission of the horse to the clinic was in September, 1954, when a second operation was performed and the remaining testicle removed. It was a difficult operation in which exploration of the abdominal contents, markedly distorted with visceral adhesions, lasted over 30 minutes. The major portion of the abdominal exploration was made through the left inguinal canal which was sutured on completion of surgery. After removal of the right testicle, the right inguinal canal was packed and retention sutures placed in the skin as minimal operative interference had occurred on this side. Recovery was satisfactory, except for some postoperative scrotal edema, and the patient was discharged after 27 days of hospitalization.

From the Department of Surgery, New York State Veterinary College, Cornell University, Ithaca.

Three to four weeks later, a small swelling about 5 cm. in diameter was noticed on the right side of the scrotum. As this developed, colic in a mild form, indicated by rolling and slight sweating, was present for two to three days, after which no further attacks were noticed.

Six months later, when again admitted to the large animal clinic, the swelling had increased to approximately 20 cm. in diameter. Palpation revealed an almost painless and partially reducible hernia of the right inguinal region.

Surgery.—After a 48-hour preoperative fast to decrease the bowel content, side-lines were applied and 300 cc. of equithesin were administered intravenously. The patient was cast and the hindlegs secured in the usual manner. Another 100 cc. of the anesthetic solution was required for surgical anesthesia. The patient was rolled to dorsal recumbency, with his hindlegs extended upward and backward, and secured to the edge of the box stall. The forelimbs were secured in a knee-chest position.

The right inguinal region was clipped with a fine surgical clipper, scrubbed with soap and water, defatted with ether, swabbed with 70 per cent alcohol and 2 per cent aqueous iodine. A 25-cm. incision was made over the indurated base of the hernia. As a result of extensive adhesions, sharp dissection was required to isolate the hernial sac and ring. Entry into the hernial sac revealed several feet of small bowel with multiple adhesions. Areas of the small bowel had been traumatized as evidenced by ecchymotic hemorrhages and fibrous tags on the serosal surface. During the attempt to break down intestinal adhesions, the bowel was accidentally incised. This was repaired with an interrupted Czerny-Lembert suture using No. 1 plain catgut. Further efforts were then made to break down the firm adhesion between the bowel and peritoneum of the hernial sac. Because of the time that would have been required to complete this manipulation, during which the bowel would have been exposed to air and dust-borne contaminants, an intestinal resection and anastomosis was performed.

Approximately 70 cm. of intestine was prepared for removal. First the mesenteric vessel of the segment was ligated and the mesentery was severed. Heavy hemostatic

clamps with 3-inch jaws were then placed on the bowel and, adjacent to the clamps, an assistant with moistened saline sponges held the bowel segment and manually obliterated the lumen. The bowel was then severed between the clamps and the sponges and the clamped ends were brought together and held in close proximity. Using No. 1 plain catgut, with a swaged, straight atraumatic needle, a continuous Czerny suture was placed in the bowel wall, starting at the mesenteric attachment. This line of sutures was then buried with a row of simple interrupted Lembert sutures. After the first suture row was complete, normal peristaltic waves were seen to course across the anastomotic site. The bowel area was washed with warm physiological saline solution, replaced, and 1.5 million units of crystalline penicillin sprayed into the abdominal cavity.

The hernial sac was amputated close to the abdominal wall, leaving sufficient tissue to cover the hernial orifice. The sac was closed with No. 1 chromic catgut with a continuous suture. The hernial defect, i.e., the inguinal ring, was obliterated as well as possible by picking up fascia and muscle within the area with interrupted sutures of No. 1 chromic catgut. Deep horizontal mattress sutures of monofilament nylon were placed in the skin and a sterile turkish towel was sutured over the incision line.

Postoperatively, the gelding received, intravenously, 500 cc. of 5 per cent dextrose solution containing 500,000 units of crystalline penicillin and, intramuscularly, 6 million units of aqueous penicillin and 5 Gm. of streptomycin. All restraint was removed and an attendant watched over the animal until he came to his feet 90 minutes later.

The gelding was given penicillin (3 million units) daily for seven days, and streptomycin (5 Gm.) on the first and second postoperative days. Exercise was initiated the first postoperative day and gradually increased so that 20 days after surgery he was walked, trotted, and hand-galloped two hours daily. He was discharged after 28 days of hospitalization.

One month later the owner reported that no swelling was present and that the gelding was doing well.

Fracture of Radius and Ulna in a Dog

W. E. BLAKE, D.V.M.

Tampa, Florida

On Oct. 30, 1952, a 7-month-old female Boxer was struck by an automobile, causing a radial paralysis of the left front leg. Five months later, the leg was still paralyzed and it was amputated at the scapulo-humeral joint.



Fig. 1—Radiograph showing diagonal fracture of the radius and transverse fracture near distal end of the ulna of the Boxer.

Two years later, a motorized golf cart backed over the right front leg, resulting in a fracture of the radius and ulna (fig. 1). The radial fracture was long and diagonal, involving almost the entire length of the bone. The ulnar fracture was transverse and about 1 inch proximal to the carpal joint. Since the left front leg was absent, the problem was how the patient would be able to walk and maneuver with

Dr. Blake is a small animal practitioner in Tampa, Fla.



Fig. 2—Walking attitude assumed by Boxer after left foreleg was amputated and right foreleg was fractured.

the fractured leg. It was thought that heavy external fixation would enable the patient to use the front leg as before. Under general anesthesia, the fracture was reduced and castex[®] was applied as a cast considerably heavier than usual, due to the additional support needed. The splint was applied over the entire distal portion of the leg to the elbow.

At first the patient applied no weight on the fractured limb and chose to walk on her hindlegs with her body nearly vertical (fig. 2). This she did skillfully, having developed a good sense of balance during the two years following the amputation. Bowel action and urination were performed by gently lowering the head, chest, and fractured leg until they rested on the ground, the hind quarters remaining in a normal standing position. After three weeks, radiographs revealed that the bones were healing normally, so the heavy cast was removed and a lighter one, consisting of tape and yucca board, was applied. The patient began to bear weight on the leg but preferred to walk on the hindlegs. In another two weeks, she began using the leg and the cast was removed. At present, the leg is used exactly as was done prior to the fracture.

[®]Castex is a product of Bauer and Black, a Division of the Kendall Co., Chicago, Ill.

Large Urinary Calculus in a Dog

M. K. ANDERSON, D.V.M., and
VYTAS P. RASTAS, V.M.D.

Morris, Minnesota

The occurrence of urinary calculi in the dog is common, but this case is reported because of the unusual size of one of the stones, the severity of the signs, and the rapid recovery of the patient.

A 4-year-old female Cocker Spaniel was suffering urinary incontinence, anorexia, polydipsia, and emaciation. The temperature was normal, the respiratory rate increased, and the animal was depressed. A large painless mass, at least 4 cm. in diameter, was palpated anterior to the pelvic inlet. The bitch had not been in heat since whelping, so the conditions considered were an unusually large calculus, pyometra, or a tumor.

Exploratory laparotomy, under sodium pentobarbital anesthesia, revealed a cyanotic and congested bladder containing a hard mass. When the bladder was incised, several calculi were found and removed, the largest weighing 125 Gm. The bladder was flushed with saline, the incision closed with No. 2 catgut, double-row, right-angle Cushing inverted sutures and the abdominal wall was sutured in a conventional manner.

Postoperative care consisted of 500,000 units of penicillin intramuscularly, repeated in two days, and 5 gr. of methenamine twice daily for five days. The patient was discharged the day of the operation but was returned occasionally. The sutures were removed in ten days. Recovery was rapid and satisfactory.

Drs. Anderson and Rastas are general practitioners in Morris, Minn.

Prolonged Gestation in Cattle

Dr. E. A. Woelffer, Oconomowoc, Wis., reports doing a cesarean section on a cow which had carried her calf 40 days beyond the average parturition date. She had shown no signs of calving. The calf, an asexual monster weighing 150 lb., lived 30 minutes. He states: "Some such cows finally calve but usually with difficulty; in more cases, if left alone, the fetus and the cow finally die. Monsters weighing 300 lb. have been reported and often are asexual."

—*Hoard's Dairyman*, Aug. 10, 1955.

Preparation of a Canine Skeleton

CHARLES W. TITKEMEYER, D.V.M., M.S.

East Lansing, Michigan

ADVANCES IN bone surgery and the detection of bone impairments emphasize the importance of osteology. Practitioners are increasingly cognizant of problems relating to fractures and the relationship of the various tuberosities and depressions to the surgical area involved. The lack of skeletal material for reference, a problem for most practitioners, has been solved by some through the purchase of ready-mounted skeletons from biological supply houses* for approximately \$50 each. Others have attempted to prepare a partial or an entire skeleton by various methods ranging from the use of a pressure cooker to burial in sand. Most of the resulting failures have been due to disarticulation of the small bone groups. One practitioner reported three unsuccessful attempts to prepare a complete set of carpals.

An attempt, therefore, was made to find a practical method of preparing a canine skeleton. The first method tried was "fleshing" (removal of the viscera and the bulk of the muscle mass) followed by cooking until the remainder of the flesh could readily be removed. This was satisfactory for the skull and the large bones but proved inadequate for the smaller bones, particularly those of the feet. The cooking process disintegrated the fascia and the ligaments, allowing disarticulation of the various small bone groups. The skeleton shown in figure 1 was prepared by this method but it required approximately 100 hours for completion. This was impractical but the method was satisfactory for preparing the skull and the large limb bones. Adding lye to the water (1 oz./gal.) accelerated the cooking process, but too high a concentration caused some pitting.

The second method was the use of the leather beetle, *Dermites vulpinus*, for devouring the flesh from the skeletal material. These beetles can be acquired by placing a piece of meat in a field or woods

during warm weather and then identifying and collecting the dermestids which are attracted. Some 30 mixed adults will lay 150 to 200 eggs in ten days. They must be kept in tight cans perforated only for ventilation, for the escaped beetle is a serious pest, eating wool as well as flesh. Great success with the dermestid method of cleaning bones has been reported.¹ Skeletons remained intact, with the sutures and soft bones undisturbed. Ligaments were not weakened to the extent of losing minute bones, and structures such as the hyoid apparatus or the phalanges were retained.

To try this method, a dog was "fleshed out," partially dried, and placed in a glass museum jar containing a vigorous colony of the beetles. These scavengers were reported to eat the readily digestible flesh before attacking ligaments and tendons. Thus the degree of cleaning could be governed by appropriate timing. However, in spite of vigilance, the dermestids completely cleaned the bones in one short operation and ate tendons, ligaments, and costal cartilages, leaving a loose heap of 310 bones to be reassembled. Closer supervision might have prevented this but it was felt that the supervision given was as adequate as could be expected from anyone other than a full-time preparator.

The third method attempted was the maceration technique² consisting essen-



Fig. 1.—Canine Skeleton prepared by the boiling and reassembly method

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*Turtex Products, General Biological Supply House, Inc., 761-763 East 69th Place, Chicago 37, Ill. Wards Natural Science Establishment, Inc., 3000 Ridge Road, East, Rochester 9, N. Y.



Fig. 2—Dermestids at work on a canine skeleton. The black, hard-shelled beetle on the third rib from the left is an egg-laying adult. The remaining soft hairy ones are the prodigious protein-eating larvae.

tially of removing all the flesh possible, placing the bones in warm water in an earthenware container, and allowing maceration in a warm room for six to eight days. The process was halted in time to save the natural ligaments. A stiff brush and running water were used to remove the remaining flesh. This method proved workable but the odor was obnoxious. Any practical method must be one that can be used in the home or hospital and timing should not be a factor.

It was recommended not to attempt to use specimens that had been preserved in formalin.² However, in spite of this warning such a method was tried, as the fascia and ligaments in embalmed specimens are much tougher than those in the fresh state. The skeletal parts of a dog were immersed in 10 per cent formalin mixture for 24 hours, after which they were cooked for four hours. The cooking was primarily to remove the formalin so that the remainder of the flesh could be eaten by the dermestids. The beetles reluctantly ate the preserved flesh (fig. 2) although a few were

killed in the process. They did not eat the ligaments and tendons. A skeleton was prepared with approximately 25 hours of labor. The only serious problem encountered, other than the care of the beetles, was the hyperextension or flexion of the joints due to the shortening of the ligaments as they dried. However, the joints could be made flexible by saturation in warm water or steam.

After the formalin treatment and the subsequent cooking, the flesh could readily be removed without disturbing the strengthened ligaments. This led to the following recommended method for preparing a skeleton:

- 1) Choose a dog of medium size, 3 years of age or older. Bones of younger dogs often separate at the epiphyseal plate.

- 2) Remove the skin, viscera, and as much of the muscle mass as possible.

- 3) Disarticulate the pelvic limbs at the coxo-femoral joints and the pectoral limbs at the shoulder joints leaving intact all distal tendons and ligaments. Separate the thoracic vertebrae with their intact rib cage and sternum from the rest of the vertebral column and the skull from the atlas.

- 4) Soak all the bones except the skull in 10 per cent formalin solution for four days. The skull need not be treated as there are no ligamentous attachments that need to be strengthened by the formalin.

- 5) Boil all the bones for eight hours which, with step 4, will strengthen the ligaments and make the specimen relatively odorless.

- 6) After cooking, keep the articulated bones immersed in water except when working on them, to keep the joints flexible until properly mounted.

- 7) Scrape the bones with a scalpel or cartilage knife, avoiding injury to ligaments, tendons, and the costal cartilages.

- 8) After this cleaning, place the bones in carbon tetrachloride or in a 28 per cent solution of ammonia water for two to four hours to remove the grease.

- 9) Bleach the bones with any common household bleach such as clorox diluted with water about 1:5. The duration of immersion depends on the degree of whiteness desired, but too much bleaching will dissolve the ligaments. Ten hours in a 1:5 dilution is recommended for the small bones, the skull and large bones being left in for a longer period.

- 10) Replace the bones in water to maintain flexibility of the joints.

- 11) Mounting can be done with stiff wires or metal rods. An aluminum rod inserted through the spinal canal can be shaped to the desired conformation and will not rust. The limbs must be positioned while they are still wet and flexible.

- 12) When the skeleton has dried, repair any separated cartilages with glue. Fasten the joints

together with rust-proof wire and cover them with a transparent glue to increase rigidity.

13) Apply clear shellac or any synthetic plastic finish to the entire skeleton to decrease porosity. Plastic finishes such as quik-spray® in a pressurized container can be sprayed on easily.

The greatest advantage of this method is that with odors practically eliminated, the work can be done at home during leisure hours. The cost is small ($\frac{1}{2}$ gal. of formalin costs about \$1.25) and the labor involved is not excessive. A completed skeleton can be made by this method with 20 hours of actual work all of which, except the fleshing and cooking, is done at home. The review of osteology and the pride of having made the skeleton compensates for the hours of labor.

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²Anon.: Turtox Service Leaflet No. 9. General Biological Supply House, Inc. 761-763 East 69th Place, Chicago 37, Ill.

³Quik-spray — Sheffield Bronze Paint Corporation, Cleveland 19, Ohio.

The Stifle Shoe in Equine Wound Healing

CHARLES H. BURGER, D.V.M., M.S.

Bakersfield, California

This report describes an easily made, effective shoe for forced extension of the opposite pastern joint. Its use in treating a chronic granulating wound is described.

On Nov. 9, 1954, an 8-year-old Quarter Horse gelding was presented for treatment of a large granuloma on the posterolateral aspect of the right hind pastern. The large mass of exuberant granulation tissue, the result of a wire cut, had been treated by the owner and had developed an epithelial covering twice during the preceding year, only to "break open" when the horse was ridden.

The lateral aspect of the wall of the right hind hoof was concave to a striking degree and the whole foot was atrophied from disuse. The wound was not noteworthy other than that repeated treatment and injury had resulted in a considerable mass



Fig. 1—The attitude of the affected right hindleg (flexion of the pastern joint) of the horse before it was shod.

of fibrous scar tissue in the area of the granuloma (fig. 1).

The history and physical examination revealed that the horse favored the leg and kept the affected pastern joint flexed almost continuously. The problem was to shoe the horse so that he would have to stand on the injured foot and let the wound heal with the pastern joint in the extended position. With the cooperation of the local farrier, a set of shoes was made that accomplished this forced standing on the affected foot and resulted in satisfactory correction of the atrophied foot and permanent closure of the wound.

Forty-eight hours before applying the



Fig. 2—Forced extension of the affected right hind pastern joint with the corrective shoes and pressure bandage in place. Notice the arched transverse bar on the left shoe.

Dr. Burger is engaged in equine practice in Bakersfield, Calif.

The author thanks Mr. Robert Casey, the cooperative farrier who made the shoes described in this report.

corrective shoes, the granuloma and surrounding scar tissue were removed surgically. Terramycin® powder was applied to the wound and hemorrhage was controlled with a pressure bandage.



Fig. 3—The ventral view of the shoes, with the "stifle shoe" on the left and the bar shoe with spoon on the right.

The shoe for the left foot is often referred to as a "stifle shoe" because of its use on stifted horses to enforce use of an affected limb. This shoe (fig. 2, 3, 4) was forge-welded from an ordinary No. 2 light steel shoe and two pieces of flat steel 1 inch by $\frac{1}{4}$ inch by 7 inches. The shoe for the



Fig. 4—Dorsal view of the shoes illustrating the height of the rocker irons on the "stifle shoe" and the convexity of the bar on the shoe on the right.

atrophied right hindleg was a bar shoe with a spoon to force pressure on the frog and thus to enlarge that foot (fig. 3, 4).

The two shoes were approximately even in weight and were well tolerated by the horse which could walk and trot without stumbling immediately after shoeing.

The shoes were left on for six weeks, after which time normal shoes were applied.

Crosses between Aberdeen Angus, Herefords, and Shorthorns gained and graded better and were more profitable as feeders than purebred cattle.—*Highlights in Agric. Sci.*, June 15, 1955.

Viral Infertility in Cattle

Bovine infertility, apparently not associated with recognized genital diseases, was studied (*Brit. Vet. J.*, July, 1955). The venereal transmission of a filterable virus capable of inducing an endometritis is believed to enhance the virulence of potentially pathogenic organisms already present. Clinically, it is commonly associated with *Vibrio fetus* infection but, in some herds, investigation has failed to reveal *V. fetus* or any other known pathogen.

Prolonged Cross-Circulation in Dogs

Experimental cross-circulation was successfully done at the Naval Medical Research Institute, Bethesda, Md., with eight pairs of nonanesthetized dogs for 47 to 100 hours. Under sodium pentobarbital anesthesia, an external jugular vein and a carotid artery of 2 dogs were cannulated with polyethylene tubing, then the carotid of each was connected to the vein of the other dog. The necks of the 2 dogs were then snugly approximated with a plaster cast with the connecting tubing exposed. Every six hours the animals were given heparin (2 mg./kg.). They ate and drank well but had difficulty in ambulation the first day. The blood flow ranged from 200 to 700 ml. per minute. Two pairs of dogs were successfully cross-circulated a second time.—*Science*, Aug. 5, 1955.

Use of Vasectomized Rams

Since placing rams with ewes during the transition from the anestrus to the estrous season has been found to stimulate the first heat period, the use of vasectomized rams for this purpose is becoming popular in Australia. They should be replaced with fertile rams in 14 days, which is about three days before the first (stimulated) estrus will occur in many of these ewes. Yearling rams are preferred for vasectomizing, especially Merinos because of their more profitable fleece and their greater tendency to stay with the flock.—*J. Agric. South Australia*, May, 1955.

"Perinatal mortality" is a term coined in 1948 to include late fetal and neonatal deaths. It indicates the loss of life just before, during, or just after birth.—*J. Am. M.A.*, Sept. 24, 1955.

Surgical Intervention in Intestinal Lymphosarcoma in Two Cats

DONALD F. PATTERSON, D.V.M., and HANS MEIER, D.V.M.

Boston, Massachusetts

LYMPHOSARCOMA in the cat has been extensively described by Holzworth and Nielsen^{1,2} in two recent papers in which 29 cases were presented. Tumors are most commonly found in abdominal and thoracic organs, but also in such unusual locations as tonsils and mandibular salivary glands.

The cases here presented are reported because they represent attempts at surgical intervention for intestinal lympho-

Home treatment with oral chlortetracycline was prescribed, with surgery to be considered later.

When returned in three days for hospitalization, the cat's general attitude had improved and the temperature was 103.2 F. A lateral radiograph revealed a single well-defined mass in mid-abdomen. Treatment with 50 mg. of chlortetracycline every eight hours was continued, and 75

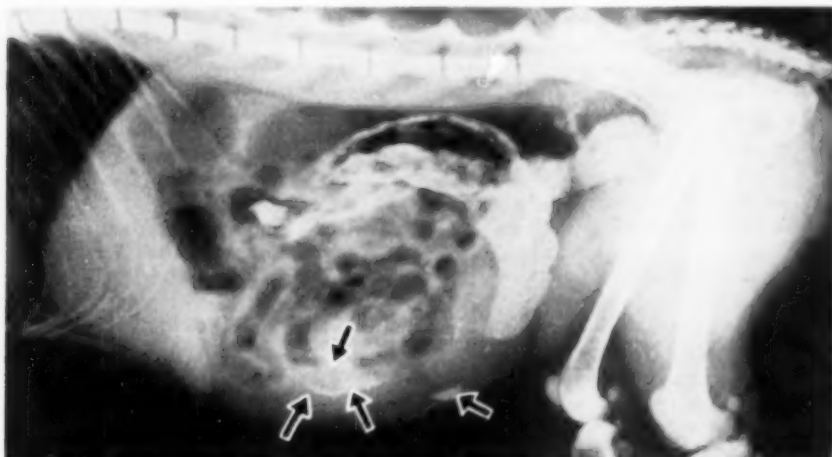


Fig. 1—This radiograph of a cat (case 1), taken 24 hours after barium administration, shows thickened segment of the small intestine and streaks of retained barium. The isolated area of retention (arrows) represents a crater-like ulcer of the mucosa.

sarcoma. In addition, 1 provides an instance of tumor growth in a site not previously recorded.

CASE 1*

On July 21, 1953, a 5-year-old female calico cat was presented with a history of partial anorexia, occasional vomiting, weight loss, and lethargy for two weeks. It had a large sensitive mass in mid-abdomen and a temperature of 105.6 F.

Dr. Patterson is an intern and Dr. Meier is resident in pathology at Angell Memorial Animal Hospital, Boston, Mass.

*Grateful acknowledgment is made to Dr. John Whitehead for the use of this case.

cc. of isotonic saline and dextrose solution were given twice daily by subcutaneous injection. On the third day of hospitalization, an exploratory operation was performed under pentobarbital sodium anesthesia. A tumor mass involving the terminal ileum, cecum, and proximal few centimeters of the colon was removed, and the ileum and colon were anastomosed end-to-end by a Cushing stitch to approximate and invert the intestinal edges. Mucosal ulcers in the involved segment had penetrated the tumorous wall, resulting in a local area of peritonitis. The mesenteric lymph nodes appeared normal, and exami-

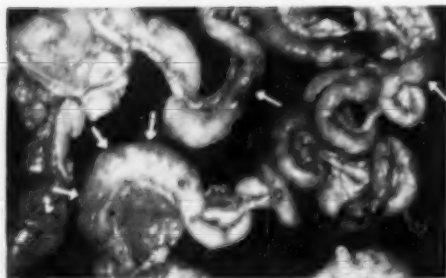


Fig. 2—Multiple lymphosarcoma of the intestine of a cat (case 2). Segmental and antimesenteric distribution (arrows) of the tumor suggests a multicentric origin from Peyer's patches.

nation of other abdominal organs revealed no evidence of other tumor formation.

Postoperatively, chlortetracycline was discontinued, a penicillin-streptomycin preparation was administered intramuscularly twice daily, and subcutaneous fluid injections were continued for 48 hours. The day after surgery the cat began to eat, progressed satisfactorily, and was discharged on the seventh postoperative day.

Histological diagnosis of the surgical specimen was lymphosarcoma.

One month following discharge, the cat was again brought to the clinic for relief of a gastrointestinal disorder due to hair balls. Since that time, it has regained lost weight and vigor and, 23 months after surgery, was in excellent health.



Fig. 3—Section through the larynx of a cat (case 2) at the level of the thyroid cartilage. Note the homogeneous appearance of the tumor-infiltrated mucous membrane (arrows).

CASE 2

On November 8, 1954, a 12-year-old castrated male cat had a history of losing weight, coughing infrequently, and not feeling well for about two weeks. During the four days before entry, the cat had passed loose stools, seemed uneasy, and belched frequently. His voice had become weak with no sound resulting at times.

The cat appeared thin and depressed; its temperature was 101.6 F. An elongated, sausage-shaped mass palpated about mid-abdomen seemed to be continuous with the intestine. During the examination the cat appeared anxious and, when restraint was removed, jumped from the table and defecated on the floor. The stool was loose and grayish and contained grass and other undigested material. A lateral radiograph revealed a thickened wall in a segment of the small intestine and dilatation of the intestinal lumen. A radiograph taken 12 hours after its administration showed streaks of barium in the affected portion and in a circumscribed area about 2 cm. in diameter, suggesting an ulcer crater (fig. 1). The next day an exploratory laparotomy was performed under pentobarbital sodium anesthesia. During insertion of an endotracheal catheter, because of stertorous breathing, it was noticed that the glottis was slightly swollen. During surgery a transfusion of 60 cc. of whole blood was given.

The wall of the terminal 15 cm. of the small intestine was found to be three or four times normal thickness, and the serosal surface was hyperemic. About 2 cm. proximal to the thickened area, there was a small button-like swelling, 1 cm. in diameter, on the surface of the intestine opposite the mesenteric insertion. The mesenteric lymph nodes were twice normal size. While the liver appeared fatty, there was no evidence of tumor elsewhere in the abdomen. The affected segment of the intestine was removed, together with the involved mesenteric lymph nodes, the cecum, and 2 cm. of the colon. An end-to-end anastomosis of the small intestine and colon was performed by the everting method of Hertzler and Tuttle.³

The histological diagnosis of the surgical specimen was lymphosarcoma. Normal tissue at either end of the specimen proved that the excision had been ample.

The day after surgery, the cat's tem-

perature rose to 104 F., but subsided after two days of oxytetracycline therapy. On the third postoperative day, the cat began to eat and, when discharged on the tenth day, had gained considerable weight, was quite vigorous, and had normal stools.

When readmitted 23 days later, for a skin disorder, the cat had gained several pounds and was strong and active. Hematological findings at this time were normal. The cat continued to make occasional weak sounds but more often was unsuccessful in his attempts to cry.

A month later, the owner reported that, although eating well, the cat had begun to make a rattling sound in his throat. His stools had been soft for several days, and he had become indiscriminate in finding a place to defecate. Two days later, he was returned to the clinic with a history of anorexia, weight loss, and a pronounced increase in the rattle in his throat. He passed frequent loose stools, was depressed and slightly dyspneic, making a stertorous sound at both inspiration and expiration. Auscultation suggested that the sound was originating in the larynx. The abdomen seemed full, considering the general condition of the cat, and a small mass was palpable in mid-abdomen. Radiographs suggested diffuse increased density in the abdomen and the possibility of several small masses. A radiograph of the chest revealed nothing abnormal. Because of the progressive respiratory symptoms and the suspicion of recurrence of the intestinal tumor, the animal was destroyed with intravenous pentobarbital on Jan. 10, 1955, three months from the day of surgery.

Gross Pathology.—The entire small intestine was covered with raised, subserosal areas of a homogeneous tissue, friable and gray or cream-colored with areas of superficial reddening. These lesions, varying from one to several centimeters in diameter, were mainly opposite the mesenteric insertion; some were circumscribed, others confluent, with a few completely encircling the intestinal tube (fig. 2). The omentum adhered to the ileocolic junction and, at that point, the intestine was greatly thickened, with a circular depression marking the site of anastomosis. The mucosa throughout the intestine seemed to be intact. The omentum itself appeared diffusely infiltrated by a whitish tissue.

The mucosal floor of the larynx, ap-

proximately three times normal thickness, bulged, pillow-like, into the air passage (fig. 3). The neoplastic tissue found there did not differ from that of the other sites.

The retropharyngeal, sternal, and mesenteric lymph nodes were enlarged to about twice their normal size and on cut surface were white and glassy.

Histology.—Larynx. — The submucosal growth distorted the seromucous glands and invaded the underlying striated musculature. Its highly anaplastic nature was evidenced by cellularity, pleomorphism, and vascular tumor emboli. Round cells scattered in aggregations throughout the reticular cell network were identified as lymphocytes and plasma cells. The developmental stages of both could easily be traced. The stratified squamous epithelium had undergone vacuolar degeneration (fig. 4).

Intestine.—The growths were highly invasive and expansive in the tunica muscularis. Cells of the lymphoid series, with mitotic figures, were numerous, and cores of tumor cells indicated further rapid cell division, producing a pattern similar to

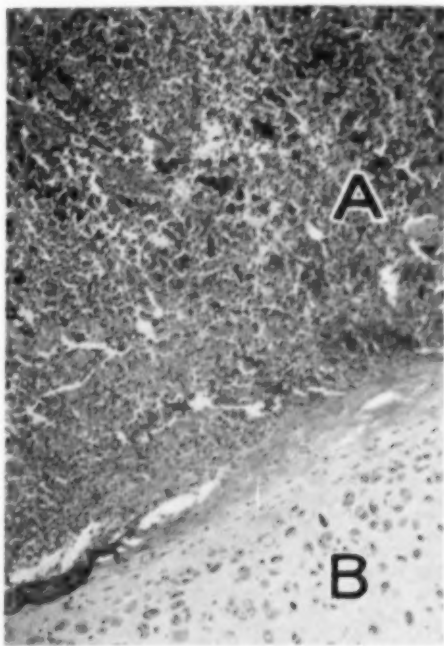


Fig. 4.—Histological appearance of laryngeal tumorous mucosa (A), and thyroid cartilage (B), of a cat (case 2).

that of an undifferentiated small-cell carcinoma. Regressive changes had taken place. Phagocytizing macrophages contained nuclear debris emanating from destroyed round cells.

Lymph Nodes and Omentum.—Diffuse lymphoid infiltration was present.

Diagnosis.—The diagnosis was lymphosarcoma, involving the retropharyngeal, sternal, and mesenteric lymph nodes, larynx, omentum, and small intestine.

DISCUSSION

Surgical removal of a lymphosarcomatous mass is effective provided: that (1) the lesion is not simply an early manifestation of a condition later to become generalized; (2) that metastases and extension have not already occurred; and (3) that the localized growth does not recur.

Before surgery is undertaken, the cat should be carefully examined and radiographs taken, to exclude the possibility of

multiple tumor formation; the blood should be examined to rule out a leukemic type of neoplasm. Apparently, the intestinal tumor removed from the first cat was a single localized lesion accompanied neither by other tumors of multicentric origin nor by metastases. However, after two years, the possibility of future development of other lymphosarcomatous lesions can not be dismissed. In the second case, surgical removal of the intestinal mass was only temporarily successful because of the development of multiple tumors of separate origin. These occur commonly in cats and can usually be accounted for by the hypothesis of multicentric origin rather than metastasis. In this case, multicentric origin in the Peyer's patches is suggested by (1) the segmental distribution of the lesion opposite the mesenteric insertion, (2) the approximately equal size of the neoplastic masses, and (3) similarity of histological appearance. The laryngeal lesion also represents a separate site of origin and was undoubtedly present at the time of surgery but was not recognized as related to the intestinal tumor.

Lymphosarcoma of the larynx has not been previously described. The signs of laryngeal involvement were infrequent coughing; abnormality, then loss, of voice; and ultimately stertorous breathing, as the submucosa became more thickened.

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Dr. G. H. Leenerts (KCV '17) of Humphrey, Neb., with his grandson, exhibiting a rarity—what might be called a cruciate bovine monstrosity. The spinal column was continuous from one normal head to the other with a relatively normal rear quarters joined on each side to the middle of that spine. Had the calf survived, it could have readily stood on all eight feet. The balance of the organs and systems seemed to be normal for two individuals.

Delivery, from the grade Hereford cow, was made under epidural anesthesia by severing the rear ends with a hook-blade embryotomy knife, removing each separately, then removing the two-headed trunk intact. The cow recovered and seemed none the worse for the experience.

The Opossum's Gestation Period

The opossum, a marsupial like the kangaroo, has a gestation period of about 13 days, the shortest of any mammal (hamsters' gestation is often 16 days). The tiny young (a teaspoon will hold 20) must find their own way by clambering up their mother's abdomen from the vulva into the pouch, where they fasten themselves to one of the mammary glands. They often remain in the pouch for 50 to 60 days.—*Sci. News Letter*, Aug. 6, 1955.

CLINICAL DATA

Elaeophoriosis in Sheep

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ELAEPHORIOSIS, a chronic parasitic disease characterized by dermatitis, stomatitis, rhinitis, and keratitis, occurs in sheep and is caused by the nematode *Elaeophora schneideri*. Microfilarids are found in the inflammatory lesions and adult filarids are in the arteries that supply the affected tissues.

This disease was first discovered in 1938 in sheep of Arizona, Colorado, New Mexico, and Utah by Kemper¹ who described cutaneous lesions of the poll, nose, lips, feet, and abdomen. Kemper postulated that the primary cutaneous lesions were in the skin of the head and that scratching the head lesions with the hind foot transferred viable microfilarids from the skin of the head to that of the hind feet, where secondary skin lesions were produced. Adult *E. schneideri* described by Wehr and Dikmans² were found in the terminal carotid arteries, the aorta, and the anterior mesenteric artery. Microfilarids were found in the tissue and in the vessels of cutaneous lesions. Davis and Kemper³ studied gross lesions and the histopathology of cutaneous head lesions of filarial dermatosis of sheep. Douglas, Cordy, and Spurlock⁴ reported cutaneous lesions of filarial dermatosis in sheep of California.

The literature reviewed on this subject described lesions of the skin only. This study was conducted to determine the pathological condition of skin and other organs of sheep with elaeophoriosis.

MATERIALS AND METHODS

Sheep.—Eighteen range ewes, from several range bands, which had been affected with elaeophoriosis from one to three years were obtained from southwestern Colorado. Their ages varied from 2 years old to quite old, the majority being aged. Their physical condition ranged from good to poor. In one band which consisted of 1,700 ewes, approximately 10 new cases of elaeophoriosis developed annually. According to the owner, many

cases healed spontaneously after a course of three years.

Necropsy.—The 18 affected sheep were necropsied. All organs were examined and major arteries were incised longitudinally. The anatomical location, size, and appearance of the lesions were determined. The anatomical location, number, and sex of adult filarids were also determined. Histosections were prepared from representative lesions.

RESULTS

Gross Pathology.—Lesions were present in the skin, cornea, mouth, nasal cavity, and arteries. Cutaneous lesions on the head and feet were usually unilateral. In 1 animal, the left hind foot and left front foot were affected. Active skin lesions varied in size from 1 to 10 cm. in diameter. The skin was denuded of hair and wool and a heavy crust of dehydrated serum and exudate covered the surface. Some lesions were traumatized and hemorrhagic. Healed lesions were denuded, scarred and, in some cases, excessively keratinized. Chronic infection of the coronary bands was associated with deformity of the hoofs.

The corneas of 3 of the 18 sheep (16.6%) were opaque and thickened, the thickening extended into the conjunctiva of the medial canthus. Keratitis coexisted with dermatitis on the same side of the face.

Unilateral stomatitis which extended over the hard and soft palates and the buccal mucosa was present in 8 animals (44%). The affected hard palates contained multiple ulcers which measured 1 to 5 mm. in diameter and 1 to 2 mm. in depth. Edges of the ulcers were elevated and indurated. Toward the free border of the soft palate, yellow, elevated, circumscribed lesions extended across the midline to the normal side. Commonly, the free border was excessively thickened. The buccal mucosa, including the villi, was thickened, indurated, and usually intact. Some villi were thickened, shortened, and fibrosed.

From the School of Veterinary Medicine and Agricultural Experiment Station, Colorado A. & M. College, Fort Collins.

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The sheep were located and reported by Dr. Norman W. Eyt, Montrose, Colo., and Dr. K. W. Grush, Durango, Colo.



Fig. 1—Unilateral microfilarial dermatitis and keratitis on the face of a sheep affected with alopecia. The cornea is opaque. Some hair has been replaced by exudate. $\times 0.6$.

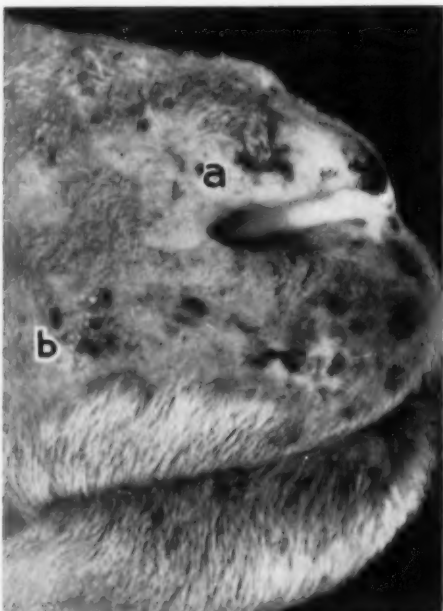


Fig. 2—Healing unilateral microfilarial dermatitis on skin of upper lip and nose of a sheep. (a) skin healed and denuded, (b) small crust. $\times 1.1$.

Unilateral chronic proliferative rhinitis was present in 5 animals (27.7%). The anterior nares, posterior nares, turbinates, meatuses, ethmoturbinates, and frontal sinuses were affected. Lesions were multiple, yellow, elevated and varied from 1 to 10 mm. in diameter and from 1 to 2 mm. in elevation. The mucosa was intact and thickened. In 1 animal, edematous granulation tissue completely occluded the nasal cavity and projected through the external naris.

Table 1 shows the anatomical distribution and incidence of gross lesions. Figures 1 through 8 present gross lesions of skin, cornea, mouth, and nose.

TABLE 1—Anatomical Distribution of Microfilarial Lesions

Location of microfilarial lesions	No. of sheep
Skin—head	5
Skin—head, mouth	4
Skin—head, nasal cavity	1
Skin—head, mouth, nasal cavity	2
Skin—head, mouth, nasal cavity, cornea	2
Skin—head, mouth, cornea	1
Skin—head, foot	2
Skin—front and hind feet	1
Total	18

Adult *E. schneideri* were found in the common carotid artery and its terminal branches; in the brachial, celiac, anterior mesenteric, tibial, and common digital arteries; and in the aorta. Of the 128 adult parasites in 18 ewes, 96 (75%) were in the terminal part and branches of the common carotid artery (table 2). In this location, the adult worms extended from the termination of the common carotid into the external carotid, internal maxillary, and sphenopalatine arteries. Adult female worms, and frequently males, were found in all arteries which supplied microfilarial lesions, with the exception of the common digital artery of a hind foot with a healing lesion. One sphenopalatine artery contained several male and female worms and was thrombosed. Table 2 shows the vascular distribution and incidence of adult *E. schneideri*. Figures 9 and 10 show adult worms *in situ* and free.

Histopathology.—Lesions of the skin, mouth, and nasal cavity presented the same type of chronic inflammatory reaction. The derma of the skin and lamina propria of affected mucosae were thickened from proliferation of fibrocytes and capillaries, and from massive infiltration with lymphocytes, mononuclear macrophages, and eosinophil leukocytes which predominated. Microfilarids were not abundant, and were located in areas of reaction in tissue and in the lumina of capillaries. Multinucleated foreign body giant cells were accumulated around dead microfilarids. The epithelium



Fig. 3—Microfilarial dermatitis on distal part of left front limb of a sheep. The skin contains a crust of exudate and is partly separated from the deformed hoof. $\times 0.7$.

TABLE 2—Anatomical Location and Incidence of *Elaeophora Schneideri* in 18 Ewes

Sheep (No.)	No. of adult <i>E. schneideri</i> in arteries									
	Internal maxillary		Brachial right	Celiac	Anterior mesenteric	Posterior aorta	Femoral right	Tibial		Common digital left hindfoot
	right	left						right	left	
1	....	....	....	....	....	....	....	....	....	1
2	....	8	....	....	....	....	....	....	....	....
3	3	7	....	....	2	....	....	....	....	....
4	2	....	....	....	....	....	....	....	....	....
5	4	1	....	....	6	....	1	....	....	....
6	4	1	....	....	2	....	....	2	....	....
7	6	8	....	....	....	....	....	....	1	....
8	7	5	....	....	2	....	2	....	....	....
9	....	5	....	....	....	1	....	....	....	....
10	3	....	1	....	....	....	....	....	....	....
11	....	5	....	1	....	....	....	....	....	....
12	2	....	....	....	1	2	....	....	....	....
13	....	5	....	....	....	3	2	....	....	....
14	1	....	....	....	1	1	....	....	....	....
15	1	....	....	....	....	....	....	....	....	....
16	2	3	....	....	....	....	....	....	....	....
17	3	1	....	....	....	....	....	....	....	....
18	5	....	....	....	....	....	....	....	....	....
Total	47	49	1	5	12	7	9	2	1	1



Fig. 4—Unilateral microfilarial stomatitis of the hard palate of a sheep. The right side of the palate contains multiple ulcers (a). Some transverse ridges are deformed. $\times 1.0$.



Fig. 5—Posterior hard and soft palates of the same sheep as shown in figure 4. Right side of palate contains ulcers (a). The anterior is toward the top. $\times 1.1$.

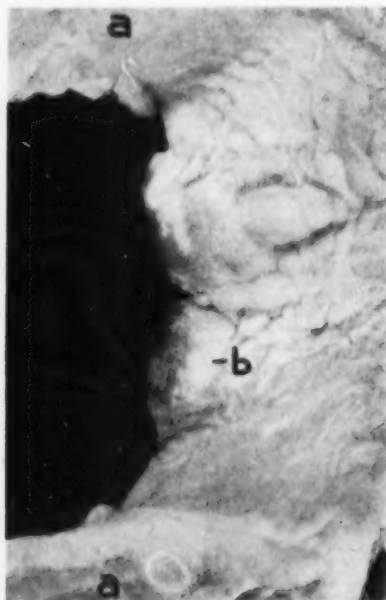


Fig. 6—Nonulcerative foci of microfilarial infection on the pharyngeal surface and free border of the soft palate of a sheep. The anterior is toward the right. (a) Anterior pillars, and (b) focus of infection on free border. $\times 1.6$.

of the skin was parakeratotic. Rete pegs were lengthened and the stratum granulosum and stratum corneum contained small vesicles. The epithelium of the hard palate was ulcerated in foci. Healed ulcers were re-epithelialized, and the epithelium was intact over rhinal and corneal lesions. Figures 11 through 14 show the histopathological condition of lesions of surface membranes.

The thrombus, which was located in a sphenopalatine artery, was organized by fibrocytes. Endothelialized canals and multiple adult *E. schneideri* traversed the thrombus. Figure 14 shows the histopathological condition of the thrombus.

DISCUSSION

Although adult male and female *E. schneideri* were widely distributed in the arterial system, microfilarial lesions were found only in membranes which were exposed to external environment. This distribution suggests (1) a positive tropism by the microfilarids for membranes which are exposed to the surface, or (2) that the environment of a surface membrane is necessary for survival of the microfilarids. The microfilarids of all lesions, including those of the feet, probably are produced by adult female *E. schneideri* which are

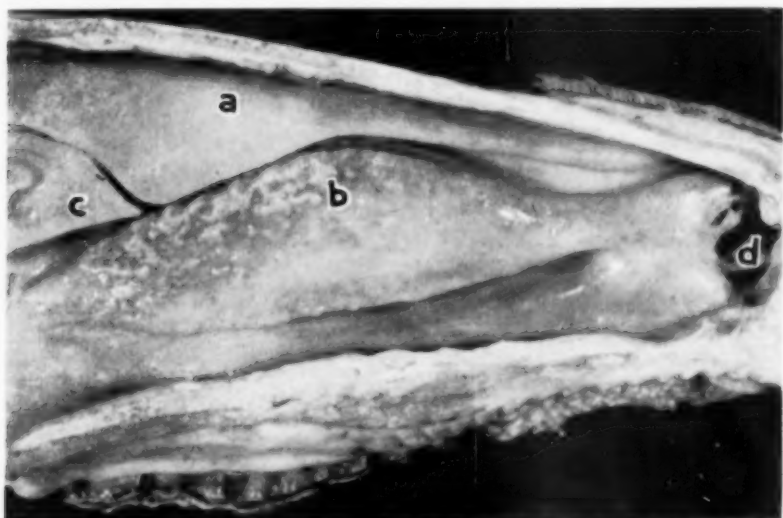


Fig. 7—Unilateral microfilarial infection in mucosa of left ventral turbinate of a sheep. Foci of infection are pale and elevated; (a) dorsal turbinate, (b) ventral turbinate, (c) ethmoturbinate, and (d) external naris. $\times 0.9$.

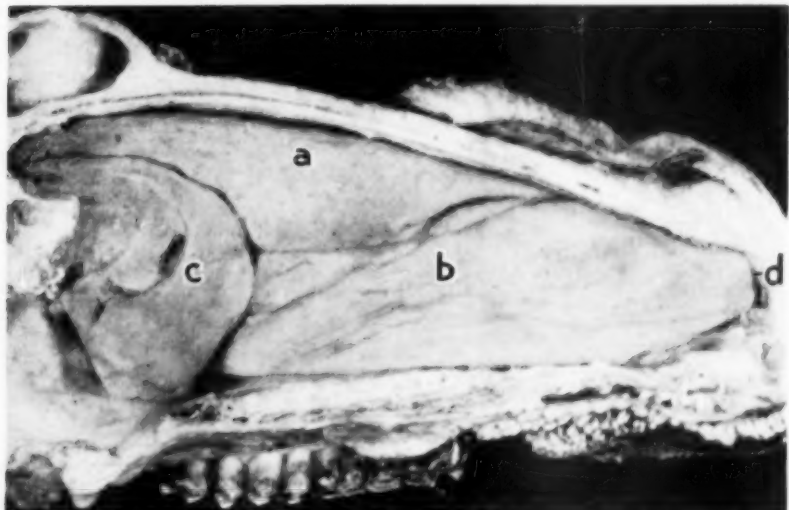


Fig. 8—Unilateral generalized proliferative microfilarial rhinitis in mucosa of left nasal cavity of a sheep. Thickening of mucosa caused occlusion of meatuses and external naris; (a) dorsal turbinate, (b) ventral turbinate, (c) ethmoturbinate, and (d) external naris. $\times 0.7$.



Fig. 9—Adult *Elaeophora schneideri* in situ in terminal part of the left common carotid artery which is opened longitudinally; (a) common carotid, (b) external maxillary, and (c) internal maxillary arteries. The anterior is toward the top, $\times 1.6$.



Fig. 10—Adult *Elaeophora schneideri*—male (left), female (right). The heads of the worms are at the top, $\times 1.0$.

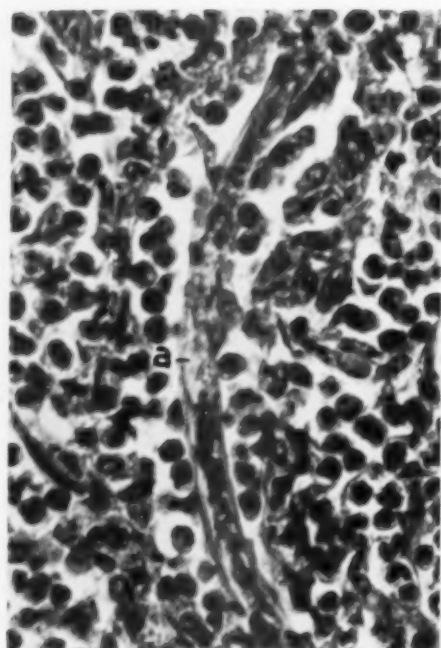


Fig. 11—Nasal mucosa which contains a longitudinal section of a microfilarid (a) surrounded by eosinophils, lymphocytes, and fibroblasts. Hematoxylin-eosin stain; $\times 550$.

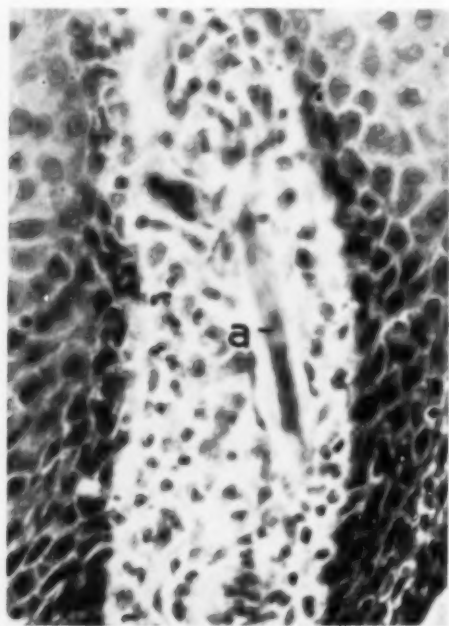


Fig. 12—Oral mucosa which contains a longitudinal section of a microfilarid (a) in a capillary. Hematoxylin-eosin stain; $\times 360$.

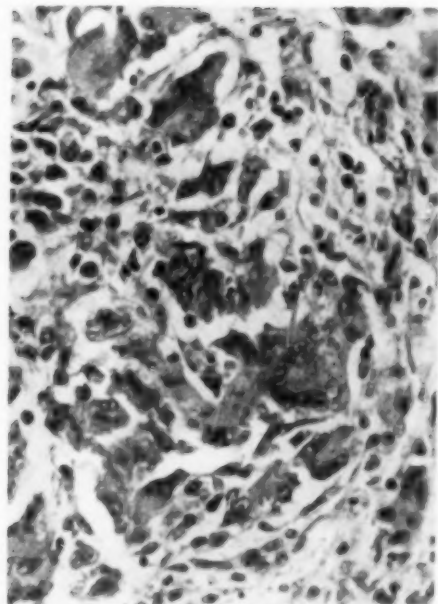


Fig. 13—Sheep palate containing multinucleated giant cells which are phagocytizing parts of dead microfilarid. Hematoxylin-eosin stain; $\times 256$.

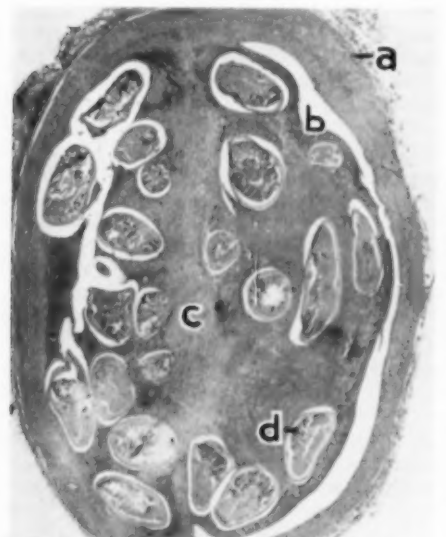


Fig. 14—Cross section of sphenopalatine artery of a sheep, which contains an organized thrombus and 22 cross sections of adult *Elaeophora schneideri*; (a) wall of artery, (b) open channel, (c) thrombus, and (d) cross section of adult *E. schneideri*. Hematoxylin-eosin stain; $\times 17$.

located in the arteries which supply the tissues affected with microfilarial lesions.

The healing of cutaneous lesions after a course of approximately three years suggests that the maximal reproductive longevity of adult female *E. schneideri* is approximately three years and that the maximal longevity of microfilarids in lesions is approximately three years.

SUMMARY

Eighteen adult range ewes affected with elaeophoriasis were studied. Microfilarial lesions were found in the skin of the head and feet and in the mucous membranes of the eyes, mouth, and nasal cavities. Most microfilarial lesions were unilateral. Adult female *Elaeophora schneideri* were located in the arteries which supplied tissues with microfilarial lesions. Adult *E. schneideri* were widely distributed in the arterial system. Thrombosis caused by the adult parasite was observed in one sphenopalatine artery.

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Tularemia in Sheep

Epizootics of tularemia may occur in range sheep, especially in the Rocky Mountain area. The wood tick, *Dermacentor andersoni*, seems to be the vector, probably having acquired the infection from rodents or rabbits and rarely transferring infection from sheep to sheep. Losses are greatest in lambs and yearlings but prompt recovery usually follows removal of the tick, suggesting that infection is not the sole cause of death. Dipping or spraying with a persistent repellent or acaricide is not only preventive but has therapeutic value. Streptomycin may also be effective. At least 7 deaths have occurred among the 189 human cases reported, mostly men who worked with these sheep.—*Pub. Health Monograph 28, U. S. Pub. Health Service.*

Erysipelas Vaccine Avirulent* (EVA)—A New Agent for Erysipelas Control

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SWINE ERYSIPELAS has long been a problem, both in the United States and in foreign countries. In 1896, Lorenz instituted the use of virulent culture, administered simultaneously with anti-swine erysipelas serum as a prophylactic measure, and this method was employed on the Continent for many years. Chronic erysipelas had previously been identified in the United States, but the acute form of the disease was first diagnosed in 1938, in the practice of Dr. Fosterman, Utica, S. Dak. Following this diagnosis, members of the Bureau of Animal Industry and veterinary practitioners in Nebraska, working with Dr. L. Van Es, developed a program for the vaccination of swine against erysipelas following the classic method of Lorenz. However, since this form of prophylaxis required the use of a living, virulent culture, there were the disadvantages of possible premise infection and spread of the disease in swine, as well as the danger of infection to the veterinarian, swine producer, and meat packer.

In an effort to improve the immunization procedure, numerous studies were instituted by several investigators. Traub¹ reported on the use of an adsorbate bacterin made of killed culture containing several strains of the erysipelas organism adsorbed on aluminum hydroxide. Bacterins of this type became available a few years ago.

Critical use and testing of adsorbate bacterins revealed that they produced a relatively short period of immunity.² This type of product should not be used where immediate protection is required, since the simultaneous administration of anti-swine erysipelas serum interferes with the antigenic stimulation. The bacterin's only advantage lies in the fact that a killed product is used, but this would not seem to justify its use when the longer and more solid immunity produced by the prior agents is considered.

Recently, a lysed vaccine^{3,4} developed in France became available for use in the United States. This vaccine is not a living agent, and is composed of

disintegrated erysipelas organisms in a saponin base. The development of this product is relatively new and sufficient time for accurate analysis has not elapsed.

Immunizing agents against swine erysipelas have been in use for many years without definite knowledge as to their actual antigenicity. The development of the scarification test (fig. 1, 2, 3)^{5,6} has finally given investigators a means by which the production and duration of immunity in swine could be rapidly and accurately verified. Through this test, inadequacies of the available immunizing agents have been demonstrated and investigations stimulated.

DEVELOPMENT OF A NEW VACCINE

Believing that final solution to the erysipelas immunity problem did not lie in bacterins, experimental work was instigated with avirulent erysipelas cultures. The indications were, in the early stages of the investigation, that the culture having the least virulence for laboratory animals generally had the least antigenic power. Numerous strains were studied in an effort to produce an avirulent erysipelas vaccine, but only one strain showed the essential characteristics, i.e., high antigenicity and complete avirulence. As a result of intensive research in our laboratories, erysipelas vaccine avirulent (EVA) was developed. It has recently been licensed (special) by the Agricultural Research Service (ARS), and is now available to the veterinary profession as an aid toward the control and eradication of swine erysipelas.

Erysipelas vaccine avirulent is composed of a single avirulent strain of live *Erysipelothrix rhusiopathiae* suspended in a suitable menstruum, and finally lyophilized to provide maximum stability. EVA has the advantage of being a live culture for maximum antigenic stimulation and is entirely avirulent to mice, guinea pigs, pigeons, swine, turkeys, and man. The product may be used with or without the simultaneous administration of anti-swine erysipelas serum, and the human health hazard is completely eliminated.

In our laboratory investigations, two

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*Patent pending.

problems, avirulence and antigenic activity, were attacked simultaneously.

EXPERIMENTAL

Experiment 1.—The susceptibility of pigeons to swine erysipelas has long been established, and for many years they have been used in laboratory testing. Subcutaneous administration of 0.5 cc. of an 18- to 20-hour culture of virulent *Ery. rhusiopathiae* consistently causes death in 72 to 96 hours. Erysipelas vaccine avirulent, in quantities up to 4.0 cc., was injected into pigeons with no evidence of illness or death. Fourteen to 21 days later, these birds were challenged by the subcutaneous administration of 0.5 cc. of virulent erysipelas culture and, while all controls died within 72 to 96 hours, none of the pigeons vaccinated with EVA sickened or died.

Experiment 2.—White Swiss mice weighing 15 to 18 Gm. were injected subcutaneously with varying amounts of the EVA culture, ranging from 0.05 to 0.5 cc., and all mice survived, remaining well and healthy. At intervals ranging from 14 to 30 days following the injection of EVA, all injected mice, together with suitable controls, were challenged by the subcutaneous administration of 0.1 cc. of virulent erysipelas culture capable of killing susceptible mice in 72 to 96 hours. All vaccinated mice survived this challenge, and all susceptible controls died in 48 to 72 hours. This testing was later duplicated by ARS, and Dr. Shuman¹ reported as follows:

An examination was made to determine whether this culture could be classed as an avirulent strain. The method used and the results of the test are as follows:

1) On April 13, 1955, serum agar slants, nutrient broth, and nutrient broth containing 10 per cent horse serum were inoculated directly from the "production culture" and placed in an incubator for 24 hours.

2) On April 14, subcutaneous injections were made in young white mice, 100 receiving a graduated dosage of nutrient broth culture, and 100 receiving a parallel dosage of the 10 per cent serum broth culture. Twenty mice each in the two respective lots of mice received 0.5, 0.2, 0.1, 0.05, and 0.01 ml. of culture. Daily observations were then made for 29 days. No deaths occurred and all the mice remained clinically normal.

3) Broth cultures and serum agar slants were examined and found to be pure.

4) On May 15, 1955, all the previously inoculated mice, plus 20 controls, were injected with a 10⁻⁴ dilution of Norden's desiccated *Ery. rhusiopathiae* vaccine, serial lot 141. The controls died between the third and fourth day after injection and only 1 of the previously inoculated mice died. This particular mouse had received 0.01 ml. of the nutrient broth culture and died on the fifth day following challenge. No effort was made to recover the organism.

The results of these procedures permit the following conclusions:

1) Norden's "production culture," when grown in plain nutrient broth or in broth con-

taining 10 per cent horse serum, is avirulent for young white mice, in that it does not induce either death or clinical symptoms of erysipelas infection.

2) The "production culture" is also capable of inducing a level of immunity in mice sufficient to withstand a challenge with a virulent culture of *Ery. rhusiopathiae* 30 days following inoculation.

Experiment 3.—Controlled experiments were conducted on swine, the susceptibility of which was determined by the scarification method described by Fortner and Dinter² and modified by Shuman.³ Following demonstration of susceptibility, 20 swine weighing 60 to 70 lb. were vaccinated using 2.0 cc. of EVA and, ten to 14 days later, scarification challenge was conducted. Vaccinated pigs showed no temperature rise and no development of skin lesions, while 5 unvaccinated, susceptible control pigs from the same drove, exposed at the same time and using the same challenge culture, each showed a marked temperature rise, persisting for seven to ten days, as well as a severe hyperemia and edema, frequently generalizing with rhomboidal lesions on areas of the body separated from the scarification sites.

The favorable results in these experiments, both in laboratory animals and swine, demonstrated the feasibility of field trial testing of the product. Permission for such trials in the State of Nebraska was granted by Dr. J. L. George, state veterinarian, and their satisfactory conduct was made possible through the cooperation of veterinary practitioners and swine raisers.

Experiment 4.—The field trial testing followed the same general procedure used in our laboratory tests, susceptibility of the drove being determined by prevaccination scarification challenge. At the time of vaccination with EVA, susceptible animals were left in the drove to demonstrate the absence of premise exposure to the virulent erysipelas organism. At varying intervals following vaccination, vaccinated and control animals were selected from these droves and challenged by means of scarification to demonstrate the potency and duration of immunity engendered by the use of the product (table 1).

Experiment 5.—Although not considered a part of the field trial project and not controlled at the time, a concurrent investigation was conducted on a large feeding farm. This premise handled 2,500 to 3,000 swine, with a continuous introduction of new animals throughout the study. Erysipelas had been a constant problem on this farm, the incidence

TABLE 1—Result of Field Trial Testing of EVA

No. days postvac.	No. swine represented	No. premises involved	Immune (%)	Susceptible (%)
45	615	4	87.5	12.5
60	477	2	85.4	14.6
90	285	5	90.0	10.0
100-110	58	2	75.0	25.0
180	152	4	85.6	14.4



Fig. 1—Skin-scarification technique for determining immunity of swine for erysipelas; scarifying (left), inoculating (right).



Fig. 3—Response of erysipelas-susceptible pig 48 hours following challenge with virulent erysipelas culture. Note hyperemia and edema surrounding scarified areas.

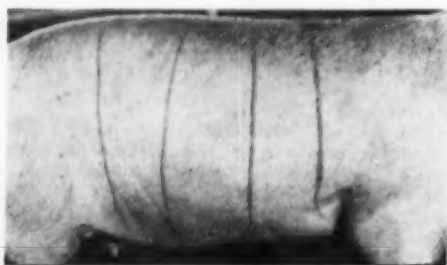


Fig. 2—Negative response of erysipelas-immune (EVA-vaccinated) pig 48 hours following challenge with virulent erysipelas culture. There was no systemic or local reaction.

varying from 4 to 10 per cent depending on the season and the year. Vaccination with EVA was adopted as a routine measure, and the product was administered at a dosage of 2.0 cc. per pig, injected subcutaneously, without anti-swine erysipelas serum. Over 7,000 swine were vaccinated, and it was observed that after vaccination the clinical incidence of erysipelas was reduced to less than 0.2 per cent over a period of 12 months. No controls were maintained, nor had pigs been challenged during the course of this project. To demonstrate premise infection, a group of 30 susceptible swine was purchased and moved from lot to lot. Within ten days, 6 of the 30 developed clinical erysipelas, ranging in severity from "diamond skin" to the acute septicemic form. With this ample demonstration of premise infection, the remaining 24 susceptible pigs were vaccinated.

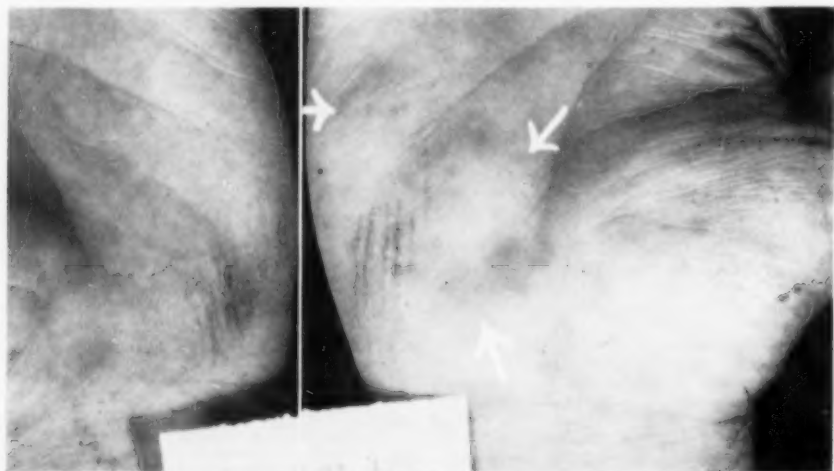


Fig. 4—Left hand (left) of a man nine days following scarification with EVA. There was no reaction at any time. Right hand (right) nine days after scarification with virulent culture, showing typical erysipeloid lesions.

Experiment 6.—*Erysipelothrix rhusiopathiae* infection in turkeys, in which resistance to the organism seems to vary, is rapidly becoming a major problem. The infection may occur in all breeds, with a marked loss of weight and, in some instances, a high death rate. Erysipelas vaccine avirulent has been administered intramuscularly in the thigh to hundreds of turkeys at a dosage ranging from 1.0 to 4.0 cc., with no reaction. There has been no instance where the injection of EVA has caused a calcification of the tendon, nor has it formed an induration in the muscle as is sometimes observed following administration of adsorbate bacterins. Extensive studies are in progress to determine the potency and duration of immunity in turkeys following this vaccination. These will be reported at a later date.

Experiment 7.—The erysipelas hazard to the veterinarian and swine raiser has always posed a serious problem. To demonstrate the avirulence of EVA in man, an arm was scratched and the avirulent erysipelas vaccine swabbed on the scratch marks. This was an adaptation of the scarification technique described previously and used in our field trial challenges. During an observation period of 14 days, no reactions were evidenced. In another instance, an individual permitted both hands to be inoculated after scratching or scarification. The left hand was swabbed with EVA, the right with an 18- to 20-hour virulent culture of *Ery. rhusiopathiae*. Within 24 hours, raised hyperemic, edematous areas were noticed on and around the scarified site on the right hand, while the left hand, over a period of 14 days, showed no dermal reaction whatsoever (fig. 4).

On premises where acute erysipelas has been diagnosed and the droves have been vaccinated with EVA, either with or without anti-swine erysipelas serum, there has been no observable difference in response. In many instances, during the early stages of the development of erysipelas-arthritis, it has been found that the administration of EVA would satisfactorily control the appearance of new joint swellings, and a marked improvement of the enlarged joints already present has been reported.⁸⁻¹⁰

The efficacy of any new product must be compared with that of existing products. Studies are in progress to determine the effectiveness of EVA in the vaccination of suckling pigs and revaccination of unbred gilts, also on the duration of immunity and other phases of the erysipelas-immunizing field. The result of these investigations will be published at a later date.

DISCUSSION

The need for more effective erysipelas immunizing agents stimulated investigational work and, after checking many cultures, one strain of *Ery. rhusiopathiae* was found that combined avirulence with high antigenicity. Avirulence of the vaccine was demonstrated by injection of large volumes

of the product in mice, pigeons, and swine, with no development of clinical symptoms or systemic reaction. All inoculated test animals—mice, pigeons, and swine—were challenged and found to be resistant to erysipelas. The avirulence and antigenicity of this culture were also checked and reported satisfactory by the Agricultural Research Service. Clinical field trials were conducted, and periodic immunity determinations showed protection in 75 to 90 per cent of the pigs tested (table 1). In two trials, the avirulence of the vaccine to man was conclusively demonstrated.

SUMMARY

1) Following extensive research, an avirulent, antigenic strain of the *Erysipelothrix rhusiopathiae* organism has been found.

2) The strain of erysipelas organism used in the production of erysipelas vaccine avirulent (EVA) has been thoroughly tested for its avirulence in mice, pigeons, guinea pigs, turkeys, swine, and man.

3) The antigenic ability of the avirulent strain of *Ery. rhusiopathiae* has been adequately demonstrated by challenge tests on all injected test animals and field trial swine.

4) Erysipelas vaccine avirulent has demonstrated a superior immunizing ability and the maintenance of a high level of immunity.

5) The simultaneous use of anti-swine erysipelas serum with EVA is not necessary.

6) Anti-swine erysipelas serum may be administered in conjunction with EVA with no adverse effect on the antigenic activity.

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The Occurrence of *Rhabditis Strongyloides* in Association with Dermatitis in a Dog

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The occurrence of *Rhabditis strongyloides* in association with dermatitis in a dog was first observed in America by D. A. Baker, of the New York State Veterinary College, Cornell University, Ithaca, N. Y., in 1931. This case was reported by Chitwood in 1932. It is the only such case we have found reported in the American literature.

Rhabditis strongyloides has been reported from various countries in Europe, and Chitwood has found it in Texas, Massachusetts, Virginia, and North Carolina. It is generally considered to be a saprophytic nematode, and is commonly found in moist, damp soil and decaying organic matter. Mönnig wrote that it is a free-living nematode which may, in rare instances, invade the skin, but probably only when the latter is already damaged. Because of the apparent infrequent occurrence of this condition in dogs in America, we are reporting the following case.

Report of Case.—A 10-month-old, female Pointer had been kept all winter in a doghouse with free access to an outdoor yard. The dog had appeared to be in excellent health. On April 1, 1955, a bale of coarse, red and sweet clover hay was purchased for bedding in the doghouse. On April 8, the owner noticed that the dog was scratching itself intensely, and loss of hair was apparent on the front feet. The animal appeared nervous and the appetite was decreased. This was mentioned to one of us (Zollman), and fungicide ointment was dispensed. The owner suspected that the bedding was causing this condition and removed it, but the dermatitis progressed. On



Fig. 1—Changes produced by dermatitis associated with *Rhabditis strongyloides* in a 10-month-old Pointer.

April 20, when the dog was brought to us for observation, a dry exfoliative dermatitis was apparent on all four feet and legs, extending onto the shoulders and thighs and over the ventral surface of the thorax. Loss of hair, redness of the skin, and a few small pustules scattered over the affected areas were observed (fig. 1). The condition seemed to cause considerable itching, and the dog scratched the lesions almost constantly. Microscopic examination of smears made from scrapings of the skin and pustules revealed large numbers of nematode larvae. These were later identified as *R. strongyloides* (fig. 2).

The source of the nematode infestation was not determined. It may have been the soil in the yard where the dog was kept or the hay used for bedding.

The affected areas were sponged with a 2 per cent solution of chlordan, which was permitted to dry on the skin. Immediately after this treatment, the dog was returned to the owner, who was advised to spray the floor and walls of the dog's house with a 2 per cent solution of chlordan before returning the animal to it.

The scratching ceased and abatement in the lesions was noticed within a week after the first treatment. A new growth of hair began to appear, and the dog's appetite and

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Fig. 2—The nematode parasite, *Rhabditis strongyloides*, isolated from scrapings of skin and pustules of the Pointer.

temperament improved. Four subsequent treatments with a 2 per cent solution of chlordan were applied and after 2 months the animal's skin was in an almost normal condition.

Comment.—The full brother of this dog exhibited no lesions on the skin at any time. He did not have access to the hay used for bedding the affected dog but the 2 were permitted contact with each other. Both received the same ration and had excellent coats prior to the development of the dermatitis on the female.

Summary.—Larvae of the nematode, *Rhabditis strongyloides*, were isolated in large numbers from scrapings and exudate obtained from an area of severe dermatitis on a 10-month-old Pointer. We have found only 1 other such case reported in America.

We feel that the nematode, *R. strongyloides*, contributed to the development of the dermatitis, because when it was destroyed by treatment, the lesions abated.

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New Disease in Young Brook Trout.—An infectious pancreatic necrosis which first appeared in January, 1954, is killing up to 80 per cent of the brook trout fingerlings in three West Virginia hatcheries. The infected fish whirl violently as if in pain.—*Sci. News Letter*, Aug. 20, 1955.

Formalin for Foot Rot in Sheep

In response to the report of the use of chloramphenicol (chloromycetin®) in the control of foot rot in sheep, a case is reported in England in which 42 per cent of 127 ewes, 140 weaned lambs, and 2 rams were infected. Using only a 10 per cent formalin solution as a foot bath following a thorough exposure of the necrotic tissue, by paring the undermined horn of the sole or wall of the hoof, 77 per cent healed after one treatment, 94 per cent after the second treatment (7 days later), and practically 100 per cent after the third treatment. Each affected foot was immersed in the 10 per cent formalin solution for 60 to 90 seconds after being pared, and the entire flock was driven into a foot bath of the same solution for not over 60 seconds after each of the three inspections.—*Vet. Rec.*, Aug. 6, 1955.

A Case of Equine Infectious Anemia

A mare which ran her last race in 1945 died in central Kentucky on July 9, 1955, from what appeared on necropsy to be equine infectious anemia. The diagnosis was confirmed when a yearling colt, inoculated with spleen tissue from the mare, developed a typical case of "swamp fever" and died. The farm was automatically quarantined for three months and plans made to test all horses on the farm. Other farms in the area were urged to control flies and other biting insects.—*The Blood-Horse*, Aug. 6, 1955.

Sodium Nitrite Poisoning from Oil

Sodium nitrite is being increasingly used in machine oils. A girl, aged 11, was hospitalized 50 minutes after taking a mouthful of such oil, some of which she spat out. She was unconscious, extremely cyanotic, and her pulse and respirations were feeble. Methemoglobinemia was diagnosed and replacement blood transfusions (1,700 ml.) started at once. An oxygen tent was used. Pyrexia and rapid pulse persisted for four days, but in fourteen days the blood was normal. Methylene blue intravenously is effective, but with a moribund patient an exchange transfusion is more satisfactory.—*J. Am. M. A.*, June 18, 1955.

[Primary interest in this item is the source of the sodium nitrite.—ED.]

Pathology of Rinderpest—An Abstract*

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THE OBJECT of this paper is to facilitate the recognition of rinderpest by providing further information on the clinical and pathological character of the disease. The information was obtained from the study of a large number of natural and experimental cases. Detailed necropsies were conducted and recorded on over 400 cases in both native African Zebu and European breeds of cattle. Tissues for histopathological study were selected from representative cases. Both kodachrome transparencies and motion pictures were taken to record the lesions on color film and to supplement the written descriptions.

Some 16 strains of the virus were studied. Although these strains were immunologically identical, they varied widely in virulence and hence in the severity of lesions produced.

Mortality varies from 25 to 90 per cent in cattle of all ages, depending upon the strain of virus and the resistance of the cattle. The incubation period following experimental administration of the virus is two to three days. Most contact infections require six to nine days.

The typical clinical course of infection with a virulent bovine strain in a susceptible adult bovine animal is briefly as follows: The onset of illness is marked by a sharp rise in temperature to 104 or 105 F., accompanied by restlessness, dryness of the muzzle, and clear tears. Within a day or two of onset, nasal and lacrimal discharges appear; there is photophobia, depression, thirst, starey coat, retarded rumination, anorexia, leukopenia, and excessive salivation. The temperature usually reaches its peak on the third to the fifth day. With the onset of diarrhea, the temperature drops but other symptoms are intensified. Oral lesions may appear by the second or third day of fever but usually do not become conspicuous until after the onset of

diarrhea. With increased severity of the diarrhea comes abdominal pain, accelerated respiration, occasional cough, severe dehydration, and emaciation, followed by prostration, subnormal temperature, and death after a course of six to 12 days.

POSTMORTEM LESIONS

Rinderpest virus has a high degree of affinity for lymphoid tissue where its effect is degenerative, leading to necrosis of lymphocytes. This is strikingly evident in microscopic sections of the lymph nodes, spleen, and Peyer's patches (plate 1, E). Almost complete destruction of lymphocytes in these tissues may take place even though the gross appearance of the tissue remains relatively normal. Since the capillary endothelium is unaffected, congestion and hemorrhage are conspicuously absent and, in gross specimens, lymph nodes and spleen often appear normal. In severe cases, necrosis in the Peyer's patches may be grossly evidenced by their black color, friable consistency, and tendency to shell out from the mucosa.

Rinderpest virus has a similar affinity for the epithelium of the digestive tract (plate 1), where it produces early and characteristic lesions. Oral lesions first appear on the inside of the lower lip, on the adjacent gum, on the cheeks near the commissures, and on the ventral surface of the free portion of the tongue. Later they may extend to all areas of the mouth with the singular exception of the anterior seven-eighths of the dorsal surface of the tongue.

Histologically, the oral mucosa is first involved in the depth of the stratified squamous epithelium. Here, just above the basal layer, a small focus of necrosis appears. This necrosis soon extends to the surface and is first seen grossly as a pinpoint of grayish white tissue surrounded by normal appearing epithelium. Movement of the tongue and cheeks causes the dead cells to be removed, leaving a sharply walled, deep pit of erosion with a red floor. Later these small pits of erosions

*This is an abstract of the paper on rinderpest which Colonel Maurer presented at the AVMA convention in Minneapolis, Aug. 15-18, 1955. The complete paper will be published in the 1955 "Proceedings Book" (Research Section).

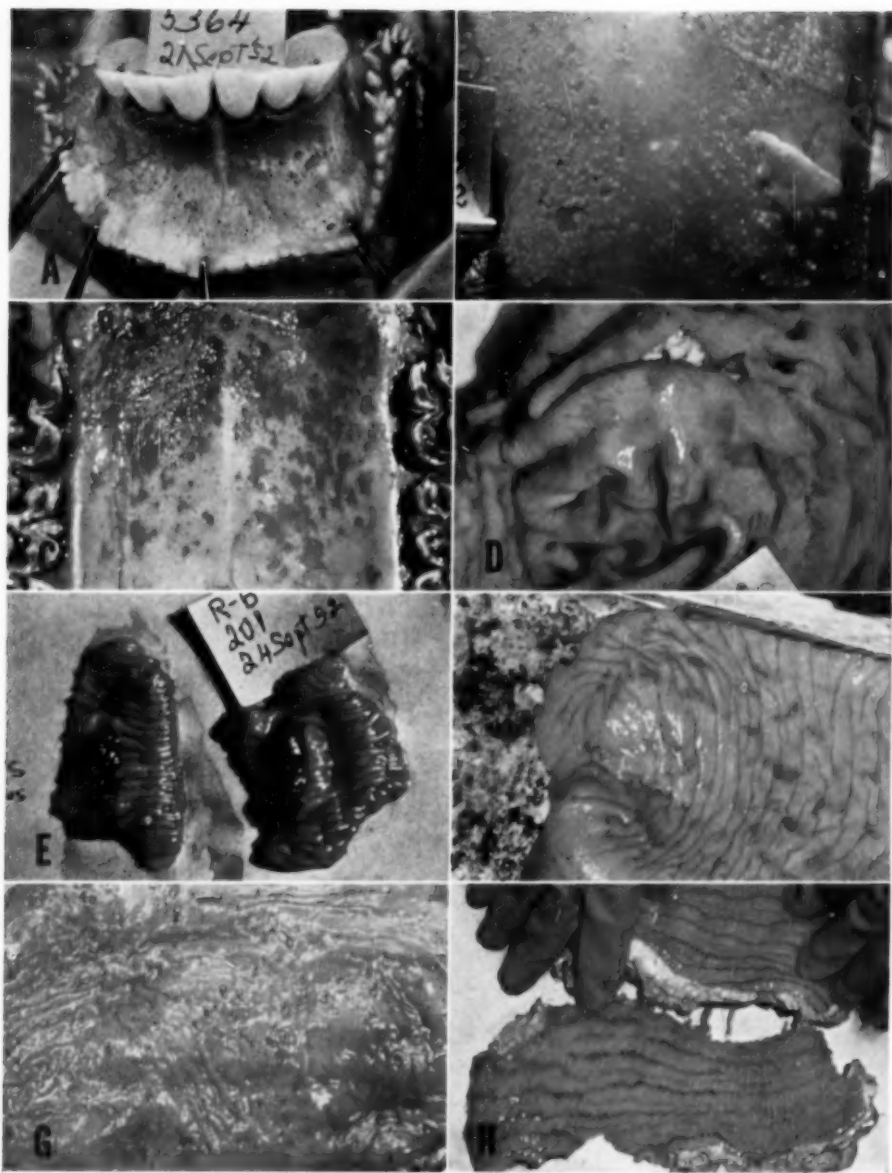


Plate I—Gross Lesions of Bovine Rinderpest

Fig. A—Areas of erosion in the mucosa of the lip and gum.

Fig. B—Early raised foci of necrotic tissue and more advanced pits of erosion on the ventral surface of the tongue.

Fig. C—Sharply demarcated erosions on the hard palate.

Fig. D—Clusters of densely packed petechiae in the mucosa of the pylorus.

Fig. E—Necrotic Peyer's patches in the ileum.

Fig. F—Typical areas of hemorrhage in the cecum.

Fig. G—Sharply demarcated erosions in the mucosa of the colon.

Fig. H—Streaks of hemorrhage along the crests of the folds of rectal mucosa.



widen and coalesce to form larger areas of erosion. The grayish pinpoint foci are difficult to see, hence the erosions are usually the first lesions observed. Similar erosions are found in the pharynx and the initial third of the esophagus. Grossly visible lesions are seldom observed in the rumen, reticulum, or omasum, although erosions of microscopic size may be found. In contrast to the mucosa of the mouth and first three stomachs, the columnar epithelium of the abomasum and intestine is thinner and its vascular bed is closer to the mucosal surface. For these reasons, when the virus invades columnar epithelium, causing necrosis and desquamation of cells, there is a more pronounced vascular response. The capillary bed becomes congested and blood cells readily escape into the stroma. In the early stages, this gives the appearance of petechial or ecchymotic hemorrhages; later, with the loss of larger areas of epithelium, shallow erosions will be recognized grossly.

The abomasum is one of the most common sites for the lesions of rinderpest. The pyloric region is most severely and consistently involved. Necrotic foci of microscopic size in the epithelium, accompanied by capillary congestion and hemorrhage in the underlying lamina propria, result in the gross appearance of irregularly outlined, superficial streaks of color which range from bright red to dark brown. Edema may be profuse in the submucosa of the fundus. As necrosis of the abomasal epithelium progresses, the affected areas assume what is more nearly a slate color and the epithelium sloughs away, leaving sharply outlined, irregularly shaped erosions with red floors from which blood oozes.

Severe lesions are less common in the small intestines than in other regions of the digestive tract. The lesions that do occur vary from streaks and irregular patches of congestion and hemorrhage to erosions and are usually found in the initial portion of the duodenum and terminal part of the ileum. Peyer's patches are often black, friable, and easily peeled out as described previously.

The crests of the folds of mucous membrane throughout the cecum are frequently bright red, due to the presence of many petechiae. Streaks of congestion and extravasation along the crests of the folds

of mucosa give it a characteristic barred or so-called "zebra-striped" appearance. Erosions and hemorrhage may occur. The mucosa in and adjacent to the ileocecal valve is frequently involved, but the most severe changes are seen at the cecocolic junction apparently because of the presence of lymphoid tissue, diverticula of the mucosa, and susceptible epithelium. Congestion, hemorrhage, and erosion of the mucosa and edematous thickening of the intestinal wall are frequent in this area.

The lesions in the colon and rectum are similar to those which appear in the cecum, the terminal portions of the rectum being most commonly involved.

The liver occasionally shows passive congestion but no specific lesions. Lesions in the gallbladder are similar to those in the lower part of the intestinal tract. They vary from scattered petechiae to diffuse blotches of hemorrhage throughout the mucosa. The gallbladder is usually distended with bile.

In the respiratory tract, the turbinates often present petechiae. Lesions in the larynx vary from a few petechiae to small areas of mucosal erosion. In the anterior third of the trachea, longitudinal streaks of rusty red hemorrhages are typically found. These are associated with varying degrees of mucosal engorgement. Erosions are uncommon. Lungs appear to be only secondarily involved. Emphysema, both interlobular and alveolar, is the most common lesion in the long-standing, severe cases.

The lesions in the heart are usually limited to diffuse subendocardial hemorrhages in the left ventricle near the papillary muscles.

Lesions in the kidneys are usually confined to congestion, particularly at the corticomedullary junction. The mucosa of the urinary bladder may show varying degrees of congestion or hemorrhage.

SUMMARY

Several hundred experimental cases of rinderpest in cattle, produced by a variety of virus strains, were studied clinically and at necropsy. Histopathological changes were found which help provide a more complete understanding of the clinical and gross manifestations of the disease.

Rinderpest virus has a selective affinity for both lymphocytes and epithelium of the

mouth and digestive tract. In the stratified squamous epithelium of the mouth and esophagus, it produces necrosis and erosion of epithelial cells of the malpighian layer with relatively little change in the underlying vessels. In contrast, the columnar epithelium of the abomasum and intestine, and the proximity of its highly vascular stroma, results in relatively severe congestion and hemorrhage associated with necrosis of the epithelium. Congestion, hemorrhage, and occasionally erosions also occur in the trachea, urinary bladder, and gallbladder. The Peyer's patches and mucosa of the cecocolic junction, which have an abundance of lymphoid tissue, are particularly affected by the virus. The lymphocytes in the lymph nodes and spleen are almost completely destroyed.

Subendocardial hemorrhages in the left ventricle, pulmonary emphysema, and passive congestion in the liver and kidneys occur secondarily but are helpful in diagnosis.

The clinical course and lesions produced by rinderpest are characteristic and presumptively diagnostic.

Tuberculosis in Cats.—The bovine type of tuberculosis has been found in 80 cats (6.3%) necropsied in Zurich since 1949. Primary lesions were found in the intestines of 50 cats, in the skins of 7, in the lungs of 8, and in the conjunctivas of 3.—*Vet. Bull., Sept., 1955.*

Tuberculin Testing of Children

Tuberculin testing of grade school children about once in ten years has, according to J. Arthur Myers, M.D., *et al.*, indicated the effectiveness of the general tuberculosis control program. Of the children tested, 47.3 per cent reacted to tuberculin in 1926, 18.9 in 1936, 7.7 in 1944, and 3.9 in 1954.

Dissemination of tubercle bacilli has been prevented by improving the techniques for finding cases, by more adequate sanatorium facilities, and by the near eradication of tuberculosis from cattle herds. The tuberculin test will detect infection soon after it occurs with uncanny accuracy, and the periodic examination of reactors will detect clinical lesions when they are most treatable. Many times more clinical cases have

been found by the test than by mass x-ray surveys.—*J. Am. M. A., Sept. 17, 1955.*

Resistance to Tuberculosis

Inheritance has an important bearing upon resistance to tuberculosis, the individual's hormone production apparently being a factor. The lungs of rabbits of known susceptible strains provided a better medium for growth of tubercle bacilli than lungs of resistant rabbits. Susceptible rabbits were found to secrete twice as much hydrocortisone as resistant animals.—*Nat. Tuberc. A., New York, N. Y.*

Tuberculosis of Avian Type in Cows.—The avian type of tubercle bacilli was isolated from 2 cows with open pulmonary tuberculosis. These cows came from "TB-free" herds in Europe. One had given a nonspecific reaction but the other had never reacted. The source of infection was not determined.—*Vet. Bull., Sept., 1955.*

French Molt in Budgerigars

French molt, a noninflammatory condition in which young "budgies" fail to develop normal feathers, is believed by Dr. Frank W. Schofield, of the Ontario Veterinary College, to be most probably a hereditary weakness which is revealed when the bird's nutrition is faulty. Environment may at times be a minor factor but the "mite myth" has been eliminated. The keratin proteins containing cystine, methionine, arginine, and glycine, so essential in feather formation, may not be present in sufficient quantity in the ration of birds with this disease.—*All Pets Magazine, Sept., 1955.*

New Growth Standards for Dairy Cows

Records kept by the U.S.D.A. for over 30 years indicate that dairy cattle grow larger than formerly. The average Jersey female now weighs as follows: 56.4 lb. at birth, 277 lb. at 6 months of age, 519 lb. at 1 year, 807 lb. at 2 years, and 1,100 lb. at 7 years, after which she loses weight slightly. Similar weights for Holstein-Friesians are: 39.6 lb. at birth, 393 lb. at 6 months, 712 lb. at 1 year, 1,115 lb. at 2 years, and 1,509 lb. at 7 years.—*Certified Milk, Sept., 1955.*

Symposium on Granulomatous Diseases—Part 2

At their fifth annual seminar held in Chicago, Nov. 27, 1954, members of the American College of Veterinary Pathologists studied the pathological changes in specimens from selected cases, after which each member made his diagnosis. The subject discussed was granulomatous diseases. Summaries of 7 of the cases were published in the October, 1955, JOURNAL (pp. 334-339).

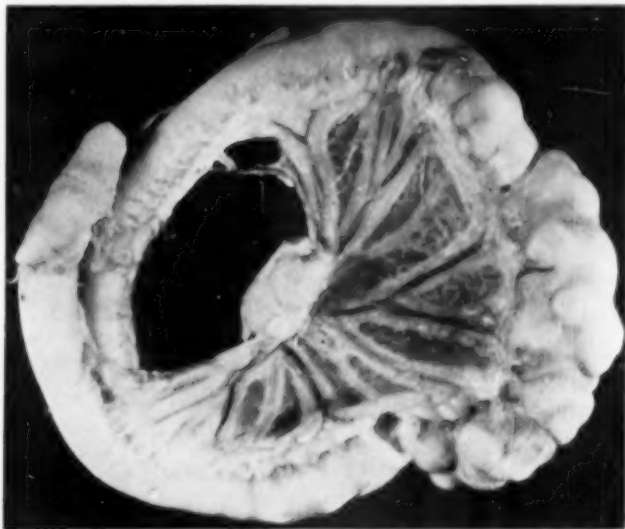
Following are cases 8 to 21, which completes the publication of the material submitted to the JOURNAL from the 1954 meeting.

CASE 8*—TOXOPLASMOSIS IN A CAT—Lt. Col. T. C. Jones, V.C., Bethesda, Md.

History.—A castrated male cat, 14 years old, was in good health until a few days before it was submitted when it began to refuse food and drink. The cat was thin, dehydrated, and was passing soft feces; the temperature was 103 F. Anemia was

Comments (Moderator Jones).—In the subserosa there were edema, lymphocytic and plasma cell infiltration, and some histiocytic cells. A few nodules were present in the subserosa and in the mesentery (fig. 8b). The basic lesion appeared to be a necrosis of the muscularis with a granulomatous response. Under higher power, a

Fig. 8a—A gross view of a segment of small intestine of a cat with toxoplasmosis. Note the nodular thickening in the muscular wall and the enlarged chain of lymph nodes in the mesentery.



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suspected because of the pale mucosae. Palpation of the abdomen revealed firm masses which apparently moved with the intestines. A laparotomy was performed and was followed by euthanasia. At necropsy, several firm enlargements of the small intestine seemed to involve the musculature (fig. 8a). The adjacent mesenteric nodes were enlarged. A section of the intestine was taken for study.

*Case 8 was previously reported by Dr. Leo I. Leiberman under the title "Intestinal Toxoplasmosis in a Cat" in the North Am. Vet., 36, (Jan., 1955): 43-45.

large number of organisms, occasionally single but usually in clumps, were observed (fig. 8c). They were somewhat elongated or ovoid, measuring about 1 by 3 μ . In Giemsa-stained sections (as these were), one can often detect an eccentric basophilic-staining body suggesting a nucleus. The organisms can be seen in hematoxylin and eosin preparations, but their details are more readily apparent in the Giemsa-stained sections. They can also be demonstrated with iron hematoxylin and van Gieson staining. This is one of the rare

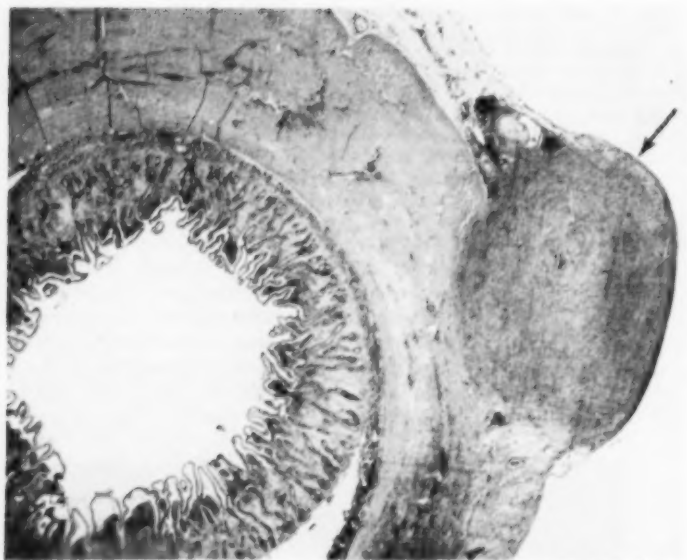


Fig. 8b—Cross section of the wall of the small intestine of a cat with toxoplasmosis. A smaller nodule (arrow) is shown partially involving the muscularis and elevating the serosa. Hematoxylin and eosin stain, $\times 10\frac{1}{2}$.

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cases in which *Toxoplasma* involve smooth muscles of the intestinal tract.

Diagnosis.—The diagnosis was toxoplasmosis, involving the musculature of the small intestine.

Discussion (Dr. R. F. Langham, Mich.).—I

have seen a case in a dog in which the organisms affected the smooth muscle of the intestine.

Dr. H. R. Seibold (Ala.).—The organisms may be seen in the lumen of uriniferous tubules in the kidney of the dog.

Dr. C. R. Cole (Ohio).—Organisms may be found in the vomitus, feces, urine, milk, and blood stream of our affected domestic animals.

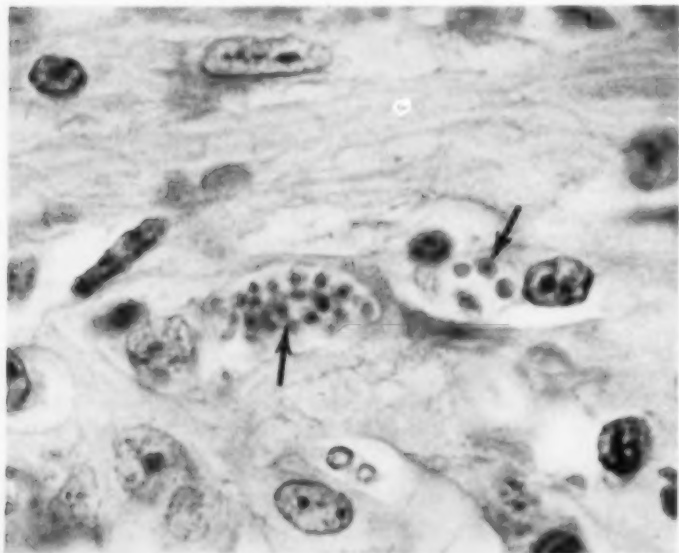


Fig. 8c—Section through the muscularis of the small intestine of a cat with toxoplasmosis. Note the numerous *Toxoplasma* organisms presumably within smooth muscle cells (arrows). Hematoxylin and eosin stain, $\times 1,485$.

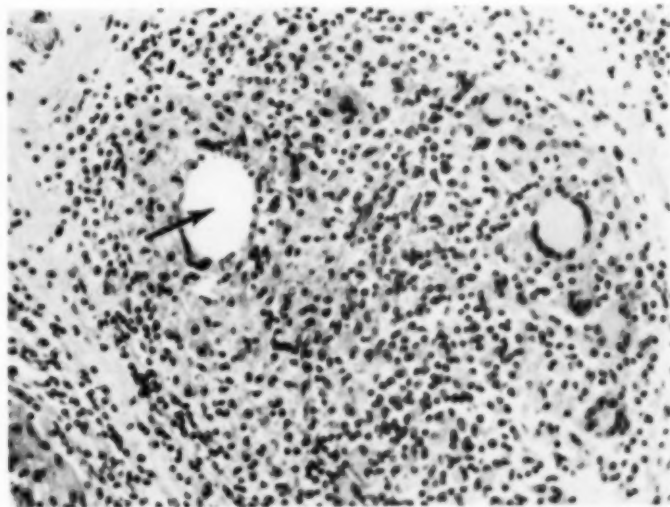
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CASE 9—GRANULOMA CAUSED BY DEAD TUBERCLE BACILLI IN MINERAL OIL—C. C. Morrill,* D.V.M., Ph.D., Urbana, Ill.

History.—Five months before death, this cow received an intraperitoneal injection of 3 Gm. of dried, killed bovine tubercle bacilli suspended in 60 ml. of mineral oil. The organisms had been grown on beef infusion medium for about eight weeks and exposed to flowing steam at 100 C. for

probably, there was some reaction to these organisms. It is of particular interest that this condition, presumably induced by the injection, was progressive, terminating in death of the animal. This section may be from a lymph node; the normal architecture was replaced by numerous discrete granulomas which were supported by dense collagenous tissue in which many lymphocytes were scattered. The small granulomas

Fig. 9a—Lipogranuloma due to mineral oil containing killed tubercle bacilli. Note the large ovoid vacuole (arrow) within the granuloma. Hematoxylin and eosin stain, x 220.



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three hours. Later, after concentration by removal of the liquid medium, it had been subjected to 15 lb. of steam pressure for 15 minutes. In six weeks the cow was positive to the intradermal tuberculin test. The animal started losing condition three months after the injection and was dead in five months. Necropsy revealed numerous flattened nodular granulomatous lesions in the peritoneum and omentum. Most of these were not more than 1.0 by 2.0 by 3.5 cm. and were homogeneously grayish pink. Some lymph nodes, such as the posterior cervical, prescapular, mediastinal, bronchial, supramammary, and lumbar, were enlarged and firm. Cultures were negative.

Comments (Moderator Jones).—I believe that this was a lipogranuloma due to the mineral oil which was injected intraperitoneally. The influence of the killed tubercle bacilli was difficult to estimate;

contained densely packed histiocytic cells in which there were a few collections of neutrophils. The entire collection was surrounded by somewhat condensed stroma and sometimes by nests of lymphocytes. Of particular significance was the presence in most of these granulomas of rather large spherical vacuoles (fig. 9). These varied considerably in size and in some instances were surrounded by a halo of neutrophils. Giant cells of the Langhans' type were numerous, both in the granulomas and around the periphery. Most of the giant cells had a foamy cytoplasm and some contained clear vacuolar spaces. Sections stained for fat and for acid-fast bacilli were noncontributory.

Diagnosis.—The diagnosis was tissue reaction to injected, killed tubercle bacilli suspended in mineral oil.

Discussion (Dr. A. G. Karlson, Minn.)—Experimental injection of guinea pigs with adjuvant plus mineral oil will produce the type of lesion

*Dr. Morrill is now head of the Department of Veterinary Pathology, Michigan State University, East Lansing.

seen in this slide. Adjuvants, mineral oil, and killed tubercle bacilli together will also result in similar lesions. Killed tubercle bacilli alone, however, will not produce these lesions.

CASE 10—ENCEPHALITIZOON ENCEPHALOMYELITIS in a RABBIT—Erwin Jungherr, D.V.M., Storrs, Conn.

History.—A 3-week-old wild cottontail rabbit died suddenly after being held in captivity four days. Gross and bacteriologi-

were concentrated around necrotic debris. The adjacent parenchyma was often edematous, capillaries were increased in number and, in a few places, lymphoid cells were seen in the Virchow-Robin spaces. The slides also included a section of the heart in which there was a necrotizing lesion involving the myocardium. It was believed that this lesion and the organisms found within it, although not typical, could

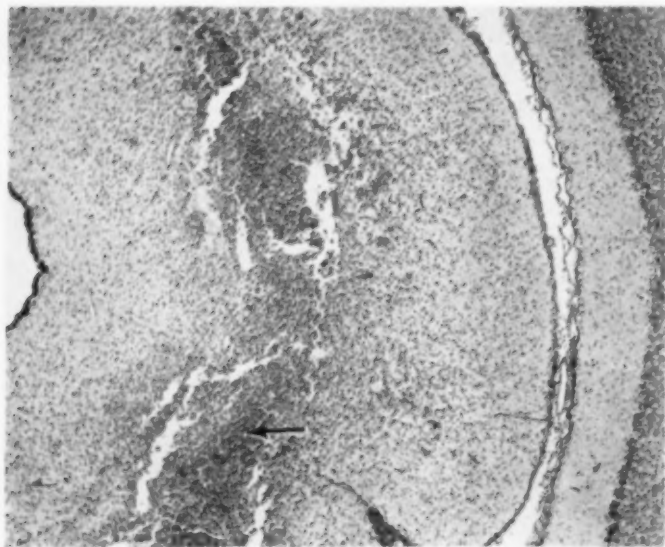


Fig. 10a—Encephalitozoon encephalomyelitis focus in brain of rabbit due to *Encephalitozoon cuniculi*. Hematoxylin and eosin stain. x 45.

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cal examination failed to disclose anything of significance. Intravenous inoculation of triturated liver and lung suspension, 1:10 in saline, into a domestic rabbit was innocuous. On histopathological examination, the lungs, liver, spleen, kidneys, eyes, and intestines appeared normal. The myocardium exhibited several granulomatous foci. Sections of the brain revealed large diffuse granulomatous areas at levels from thalamus to pons.

Comments (Moderator Jones).—The slide includes two segments of the brain, both cut somewhat tangentially. There was a severe infiltration of the meninges with lymphoid cells (fig. 10a, arrow), and also some severe, sharply delimited, necrotizing lesions involving, chiefly, the thalamus and part of the midbrain in which glial cells

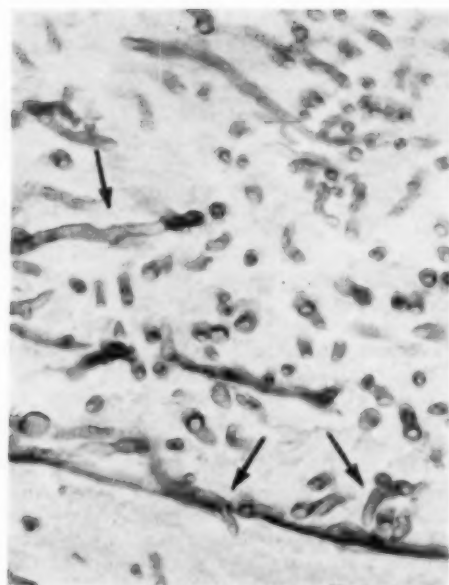
be due to *Encephalitozoon cuniculi*. Special stains failed to demonstrate the organisms clearly.

Diagnosis.—The diagnosis was focal encephalomyelitis, probably due to *E. cuniculi*.

Discussion (Dr. Jungherr).—The rabbit died naturally and the case was contributed as an example of *E. cuniculi* infection.

CASE 11—ASPERGILLOSIS IN A CAT—J. H. Sautter, D.V.M., Ph.D., St. Paul, Minn.; D. S. Steele, D.V.M., Minneapolis, Minn.; and J. F. Henry, D.V.M., Catonsville, Md.

History.—The specimen was lung tissue from a 3-year-old cat. Two of 4 Siamese cats, all of which showed similar illness, died after being sick two weeks. Each showed fever (105 to 106 F.), lacrimation,



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Fig. 11a—Section of the lung of a cat with aspergillosis, showing fungi in a granuloma. The parallel lines at the bottom of the photograph are elastic fibers of an artery. Note the mycelia of the fungus (arrows). Gridley fungus stain, $\times 648$.

conjunctivitis, and mucopurulent nasal discharge with sneezing and coughing. The cats had previously been given two doses of panleukopenia vaccine. They did not respond to any therapy.

Comments (Moderator Jones).—The sections contained a grossly visible nodule, about 2 mm. in diameter, located near the pleural surface with several tiny nodules located near small bronchioles. Under higher power, they were seen to consist of necrotic cellular debris, lymphocytes, and occasional histiocytes. These occasionally filled the alveoli or were seen within the walls either of vessels or of bronchioles. The lumen of the larger bronchioles contained mucopurulent debris. The large nodule contained a central area of necrosis surrounded by histiocytic cells, lymphocytes, and some plasma cells. It was rather sharply circumscribed but not encapsulated. It compressed the adjacent lung parenchyma. The center of this lesion contained large numbers of organisms, 3 to 4 μ by 8 to 10 μ , which in hematoxylin and eosin stain appeared as spherules or as

branching hyphae (fig. 11a). Remnants of an arterial wall were also seen in the center of this nodule.

Special stains showed these organisms to be fungous in nature. The PAS (periodic acid Schiff) method stained the capsule of the organism well, but also stained the background; hence it interfered with differentiation. The Gridley fungus stain showed the organisms particularly well, including the spherical forms and branching septate hyphae. Bauer's stain also gave good differentiation. In this case, iron hematoxylin and van Gieson's stains failed to show the organisms; they could be seen only as poorly stained or unstained bodies in the tissue. The Gridley fungus stain brought out the wall of the artery; it stained elastic tissue well. On the basis of the septate, slender branching mycelia with dichotomous arrangement, it appeared that this lesion was probably due to an organism of the genus *Aspergillus*.

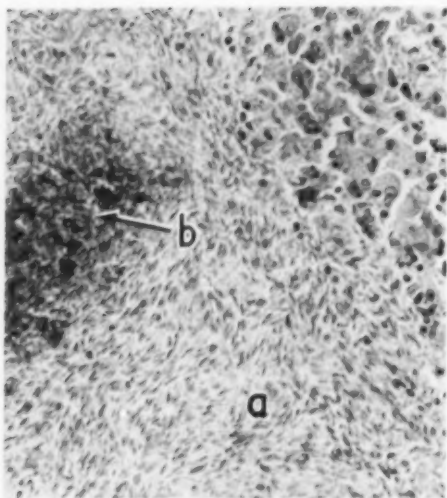
Diagnosis.—The diagnosis was pulmonary aspergillosis in a cat.

Discussion (Dr. J. H. Sautter, Minn.).—Although the first 3 cats were not necropsied, the symptoms were identical and were believed to have been due to aspergillosis. They did not respond to therapy.

CASE 12—GRANULOMATOUS SPERMATOCELE OF THE EPIDIDYMISS IN A RAM — *Kenneth McEntee, D.V.M., Ithaca, N. Y.*

History.—This tissue was taken from an 8-month-old Hampshire ram which died suddenly. The postmortem findings were bronchopneumonia lesions and an enlarged and hardened epididymis. Cultures were negative.

Comments (Moderator Jones).—In this section of epididymis of a ram, there was one large and several smaller circumscribed and encapsulated masses, some of which appeared to be formed in dilated tubules; others were embedded in the stroma. They were all filled with large numbers of spermatozoa, some of which were undergoing calcification, and were surrounded by a zone of foreign body-type giant cells, many of which had phagocytized spermatozoa. The periphery was formed by collagenous connective tissue and some lymphocytes. The areas of calcification could be well demonstrated with von



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Fig. 12a—This section of the wall of a spermatid granuloma of an ovine epididymis contains large numbers of spermatozoa (a). The dark area (b) is due to calcification. Hematoxylin and eosin stain. $\times 275$.

Kossa's stain which differentiates oxalate and phosphate which are usually present as salts of calcium. This was a spermatid granuloma which probably arose on the basis of damage to the duct epithelium with subsequent trapping of sperm which further acted as a foreign body.

Diagnosis.—The diagnosis was spermatid granuloma of the epididymis of a ram.

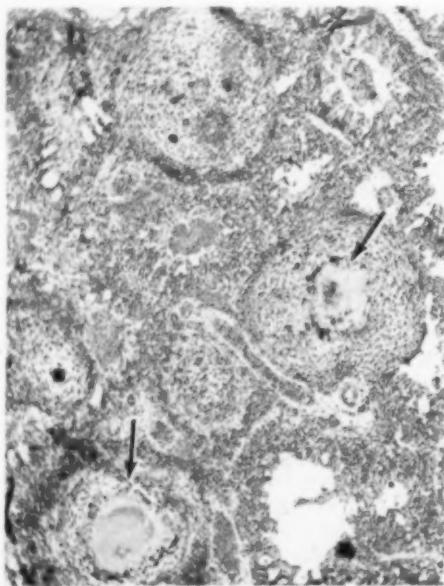
Discussion (Dr. McEntee).—The blocking of the tubules of the epididymis could result in this type of lesion. The cause of the obstruction is not always demonstrable. An acid-fast lipid is demonstrable in the semen and apparently accounts in part at least for the type of reaction which occurs. This is often seen in bulls and rams.

CASE 13—PNEUMONIC ASPERGILLOSIS IN A CHICKEN—Hilton A. Smith, D.V.M., Ph.D., College Station, Texas

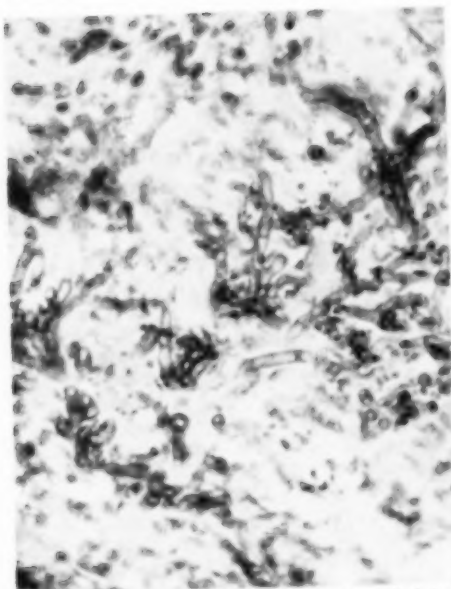
History.—This slide was made from the lung of a chicken approximately 1 year old, which exhibited a chronic respiratory disease. At necropsy, small nodules were found in the lungs.

Comments (Moderator Jones).—In this section of avian lung, the vascular system was severely engorged and, at varying in-

tervals, there were discrete spherical granulomas, some of which had necrotic centers (fig. 13a). Some granulomas appeared to arise in alveolar ducts but more often in the walls or in the interalveolar stroma where they appeared to compress adjacent alveolar ducts and surrounding alveoli. These granulomas were surrounded by a narrow zone of lymphoid cells with occasional multinucleated giant cells admixed with histiocytic cells in the center. Occasional heterophils were scattered through the granulation tissue. Many of the eosin-staining necrotic centers contained large numbers of fungous organisms (fig. 13b). The unstained spherical organisms, 2 to 4 μ in diameter, were often in columns or chains. The occasional hyphae branched and were septate. The PAS (periodic acid Schiff) reagent brought out the conidiophores and the septate hyphae which were nearly the same in diameter, but the background was so intensely stained that sharp differentiation was not as good as with the Gridley fungus stain which stained the organisms red and the background yellow. With Bauer's stain, the organisms were well demonstrated and the tissue struc-



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Fig. 13a—Spherical granulomas, some with necrotic centers (arrows), in the lung of a chicken with aspergillosis. Hematoxylin and eosin stain. $\times 65$.



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Fig. 13b—Aspergillus organisms in the center of a granuloma of an avian lung. Periodic acid Schiff reagent. $\times 540$.

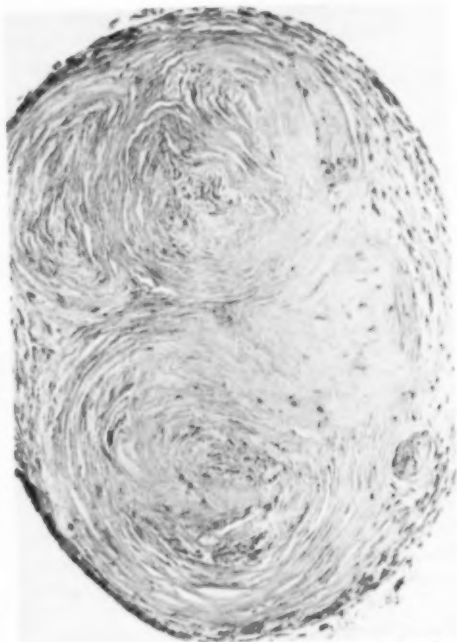
tures could also be seen. In the iron hematoxylin and van Gieson stains, the organisms were not stained and appeared as clear, unstained bodies.

Diagnosis.—The diagnosis was avian aspergillosis involving the lung.

CASE 14—SEROFIBRINOUS PERICARDITIS IN A DOG — E. A. Benbrook, V.M.D., Ames, Iowa

History.—This was a section of pericardium from a 10-year-old male German Shepherd with hydrothorax (300 cc.) and three fractured ribs. His temperature was 102, pulse 136, respiration 60, and he had inspiratory dyspnea. About 6 liters of clear transudate were removed by abdominal paracentesis and some slightly cloudy exudate from the pericardial sac. At necropsy, the pericardium was uniformly thickened, about 1 mm. There were hundreds of white, tissue-like spheres less than 1 mm. in diameter, some of which were free in the sac and others attached to the inner surface of the pericardium.

Comments (Moderator Jones).—In this case, the sections included three replicate



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Fig. 14a—Magnification of one of the spherical granulomas in the pericardium of the German Shepherd, showing organized blood clots in pericardial fluid and pericardium. Note the concentric lamination and the stellate tissue around the periphery. Hematoxylin and eosin stain. $\times 125$.

sections of a membranous structure, presumably pericardium. It was lined on one surface with simple columnar, flattened cuboidal cells and, apparently stemming from the surface, there were many spherical masses similarly covered with a layer of flattened cells. Imbedded in the superficial layers under the mesothelial lining of the pericardium were several concentrically laminated structures (fig. 14a) made up of densely collagenous connective tissue in which there were some small foci of hemosiderin. Some pendulant, spherical bodies, attached to the pericardium but floating in the pericardial fluid, were also made up of aggregations of concentrically laminated bodies of collagen in which were small nests of hemosiderin. A rather delicate stellate stroma partly surrounded the concentric bodies which lay under the endothelial surface. Iron stain identified the pigment in the centers of these small nodules as hemosiderin. This may have been

the result of the organization of some such thing as a tiny clot of blood (*viz.*, collagen and hemosiderin) in a fluid medium (pericardial fluid).

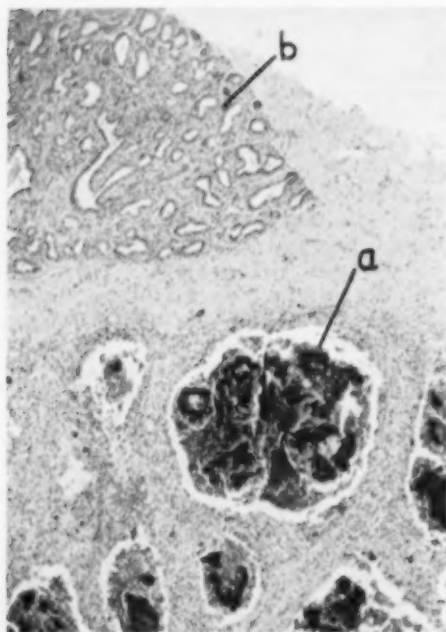
Diagnosis.—The diagnosis was serofibrinous pericarditis, etiology unknown.

Discussion (Dr. J. R. M. Innes, Md.).—A similar lesion had been reported by Neiberle and Cohrs; the changes are somewhat comparable to "joint mice." (Others partially refuted this statement by indicating that the cartilaginous component of "joint mice" was not present in the lesion.)

Dr. Benbrook.—The three broken bones in this case were recent events and were not related to the old organized exudates in the pericardial fluid.

CASE 15—CHRONIC STAPHYLOCOCCIC MASTITIS WITH GRANULOMATOUS LESIONS—E. A. Benbrook, V.M.D., Ames, Iowa

History.—A 2-year-old heifer was sick about three weeks, showing signs of depression and anorexia. The entire udder was firm and hot, and antemortem cultures were diagnosed as *Staphylococcus aureus*.



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Fig. 15a—Segment of a mammary gland of a heifer with staphylococcic mastitis, showing abscesses (a) adjacent to an unaffected mammary lobule (b). Hematoxylin and eosin stain. $\times 48$.

She was destroyed because of the udder-wide infection and severe intoxication.

At necropsy, the cut surface of the udder was yellow and the lobules were bulged, finely granular, and outlined by white fibrous tissue. Tissue sections were made.

Comments (Moderator Jones).—The section included a small segment of mammary gland (fig. 15a [b]). Most of the section was made up of large abscesses (fig. 15a [a]) separated by dense collagenous tissue. The bulk of these abscesses was occupied by colonies of organisms with a densely basophilic center and a periphery made up of radiating clubs or rods. Gram's stain of these colonies revealed them to consist of gram-positive organisms typical of staphylococci.

Diagnosis.—The diagnosis was bovine staphylococcic mastitis.

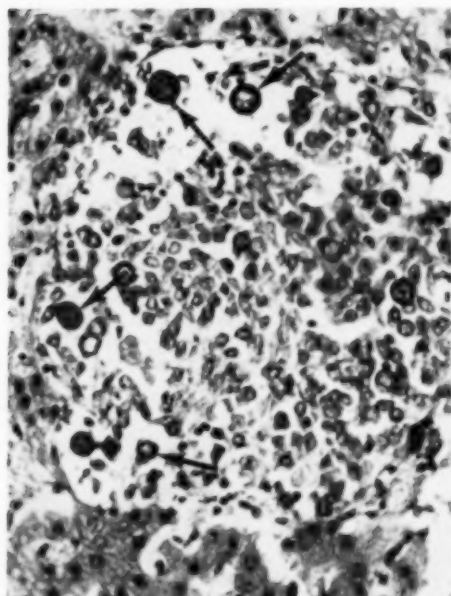
Discussion (Dr. Benbrook).—Hemolytic staphylococci were recovered and identified as *Staph. aureus*. Tissue sections showed multiple foci of *Staphylococcus* colonies, each surrounded by a zone of radiating, clublike processes. The colonies were enclosed by pus. The purulent zone was, in turn, bounded by fibroblastic tissue containing neutrophils, lymphocytes, monocytes, and histiocytes. Giant cells were numerous, especially at the outer boundaries of the pus; and many of them were filled by cocci.

This lesion was a chronic inflammatory (granulomatous) process. Older publications on this disease referred to it as "botryomycosis." This is a misnomer because it is not caused by fungi. Actually, it is a chronic staphylococcic mastitis. Reference to another similar case will be found in the JOURNAL (84, 1934:635).

CASE 16—COCCIDIOIDOMYCOSIS IN A DOG—D. R. Cordy, D.V.M., Ph.D., Davis, Calif.

History.—A 2-month-old puppy had been ill, showing symptoms of soft cough, low grade fever, and malaise. At necropsy, the liver and lungs were studded with 1-mm., gray foci which were sometimes confluent as larger masses. The spleen, kidneys, and various groups of lymph nodes were similarly, but less severely, involved.

Comments (Moderator Jones).—The section was of congested liver in which there were numerous irregularly sized granulomas which displaced liver parenchyma. These sharply delimited, but nonencapsulated, granulomas were made up of histiocytic cells admixed with lymphocytes and occasionally with neutrophils. Of particular significance was the presence of spheri-



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Fig. 16a—*Coccidioides immitis* organisms (arrows) in a granuloma of a canine liver. Bauer's stain, $\times 330$.

cal organisms in large numbers in these granulomas. These organisms had double-contoured walls, varying in diameter from about 5μ to as much as 25μ . Budding was not recognized, but in some of the organisms internal structures could be seen which suggested endospores. Not only were some of these organisms seen in the granulomas, but in many cases they were seen singly in Kupffer's cells or in liver cells gathered throughout the parenchyma. Occasionally these organisms were engulfed by foreign body-type giant cells. The PAS (periodic acid Schiff) reaction stained the capsules of these organisms particularly well. Bauer's stain and the Gridley fungus stain gave the best differentiation and brought out many organisms which were not even seen in the sections stained with hematoxylin and eosin.

Diagnosis.—The diagnosis, based on the absence of budding and the presence of endospores plus the large size of some of the organisms, was coccidioidomycosis.

CASE 17—PARATUBERCULOSIS IN A PIG—R. A. Runnells, D.V.M., M.S., East Lansing, Mich.*

History.—A portion of intestine from a 10-month-old pig had been received from a veterinarian in southern Michigan in 1938. A meager history stated that the animal had had a temperature of 104°F . and had not done well. In 1941, in another herd in the same general area, a thin, 5-month-old pig with diarrhea had a similar lesion involving the last 12 inches of ileum and most of the cecum and colon, together with contiguous lymph nodes. A specimen of colon (fig. 17a) showed a thickened, corrugated mucosa. No cultures were made.

Comments (Moderator Jones). — The slide included a transverse section of the small intestine. The tissue was well preserved and the epithelium was essentially intact (fig. 17b). The lamina propria of the mucosa as well as the submucosa were infiltrated with large numbers of huge histiocytic cells. The cells had abundant granular cytoplasm, were often multinucleated, and occasionally formed huge for-



Fig. 17a—Section of intestine from a paratuberculosis-infected pig, opened to show the thickened corrugated mucosa.

*Dr. Runnell's present address is: 471 W. South St., Kalamazoo, Mich.

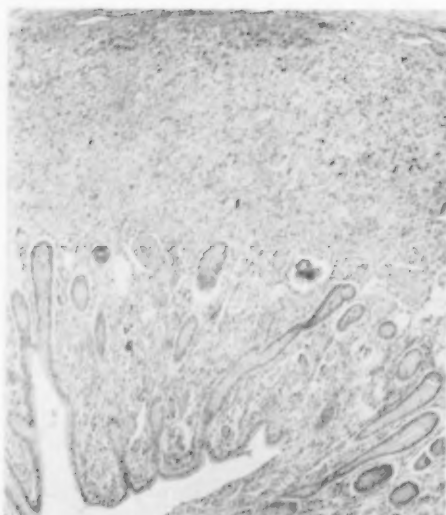


Fig. 17b—Section of the wall of the small intestine of a pig with paratuberculosis, showing thickening of mucosa and submucosa. Hematoxylin and eosin stain. $\times 48$.

eign body-type giant cells (fig. 17c, arrow). These inflammatory cells were limited to the mucosa and submucosa. The muscularis and other structures of the intestinal wall

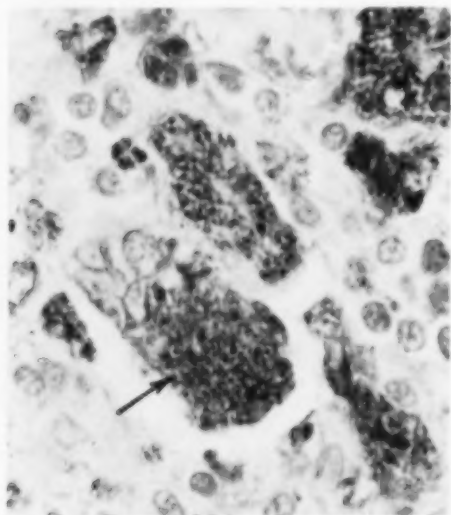


Fig. 17c—Higher magnification of histiocytic cells containing histiocytes and giant cells (arrow). $\times 1,200$.

were not involved. Acid-fast stains revealed these cells to contain myriads of acid-fast, rod-shaped organisms.

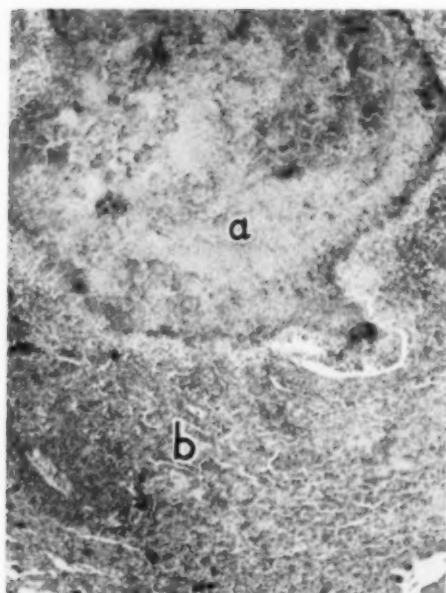
Diagnosis.—The diagnosis was paratuberculosis (or a disease pathologically identical to it) of swine. This was an unusual case as it is believed that this disease has not previously been reported in swine.

Discussion.—Some suggested that this lesion might be the result of infection with avian type tubercle bacilli, although this lesion is not typical of such an infection. Since the organism was not isolated and further identified, this point could not be settled. A similar case involving a monkey, *Macaca rhesus*, was described in which the tissue reaction was identical, although the organism was not identified.

CASE 18—EOSINOPHILIC GRANULOMA IN A HORSE—E. L. Stubbs, V.M.D., Philadelphia, Pa.

History.—The tissues for this case were from a 6-year-old female saddle horse. One year previously, in warm weather, skin eruptions had developed on the limbs near the hoofs. During the cool weather the lesions disappeared, only to return again in warm weather. In addition, open sores appeared around the eyes and on the body. When treatment failed, euthanasia was performed and at necropsy the lungs contained multiple small (0.5 to 1.0 cm.), greenish yellow nodules throughout.

Comments. (Moderator Jones).—This microscopic slide showed two sections of lung, one of which had a subpleural lesion in which there was a sharply circumscribed area of necrosis (fig. 18a [a]) surrounded by granulation tissue richly infiltrated with lymphocytes. This was, in turn, surrounded by a wide band in which the alveoli were filled with eosinophils (fig. 18a [b]). In a few places, fibrinous casts were present in the alveoli. Collars of eosinophils were noted along the interlobular septums and around bronchioles and blood vessels. In the second segment of lung, there were areas of consolidation in which the alveoli were filled with similar fibrinous material. The interlobular septums were engorged with eosinophils and also contained some fibroblastic cells and lymphocytes. Many of the bronchioles and blood vessels had a similar collar of eosinophils around them. There was no segment of necrosis in this second section.



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Fig. 18a—Parasitic nodules and nocardiosis, or both, in the lung of a mare. The large mass of necrotic tissue debris (a) is surrounded by granulation tissue (b) and many eosinophils. Hematoxylin and eosin stain, $\times 45$.

Diagnosis.—The first impression was that this lesion was due to the migration of helminth parasite larvae. This was based upon the characteristic type of necrosis and the intense eosinophilic reaction to this necrosis. It seemed somewhat unlikely that the lesions in the skin and those in the lung were related, although they would have to be seen together to be certain.

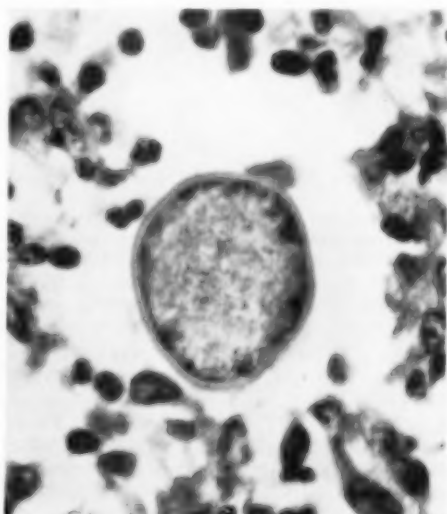
Discussion.—*Draschia megastoma* infection was favored by some as the probable etiological agent in this case and Major Charles N. Barron (Mich.) pointed out a cross section of a nematode in his slides. Dr. Stubbs reported that *Nocardia* spp. were isolated from these lesions. Many felt that this lesion might well be the result of both nematode and bacterial infection.

CASE 19—COCCIDIOIDOMYCOSIS IN A DOG.*
—J. T. McGrath, V.M.D., M.S., Philadelphia, Pa.

History.—A 2-month-old male Labrador Retriever had been kept in a kennel at Tucson, Ariz., since birth. It was shipped to Virginia by air express and was sick

on arrival. It exhibited inspiratory and expiratory dyspnea, coughing, slight fever, and moist tracheal râles. The larynx was inflamed. The animal appeared in good flesh and had a fair appetite. It was treated for two weeks before death. At necropsy, the bronchial lymph nodes were swollen, firm, and had a grayish white cut surface. There was a similar nodule in the right diaphragmatic lobe of one lung and another at the bifurcation of the bronchi.

Comments (Moderator Jones).—The section was apparently from a lymph node, although most of the normal architecture had been replaced by inflammatory tissue. The section included large areas of collagen-rich tissue infiltrated with lymphocytes and, occasionally, neutrophils in which was imbedded several microabscesses, often surrounded by a zone of histiocytic cells. In a few of these granulomas with purulent centers, there were large spherical organisms with double-contoured walls (fig. 19a). These organisms were sparse, slightly ovoid, measuring 32.5μ in length and 25.0μ in width, and contained some bodies just inside the internal capsule which were believed to be endospores. Unfortunately, the sections stained



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Fig. 19a—In this section of a canine lymph node, note the ovoid organism, *Coccidioides immitis*, with double-contoured wall containing endospores, one of a few organisms present in the midst of an intense granulomatous inflammatory region. Hematoxylin and eosin stain, $\times 1,080$.

*The tissue was received from Dr. Paul Magura, Warsaw, Va.

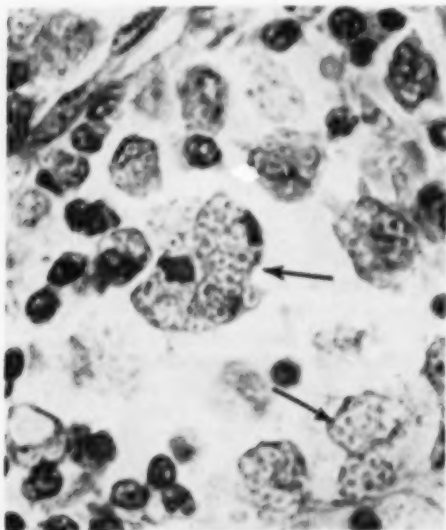
with Bauer and Gridley fungus stains did not contain organisms.

Diagnosis.—The diagnosis was canine coccidioidomycosis.

Discussion.—The intense tissue reaction and the paucity of organisms were both noteworthy in this case, which contrasts sharply with case 16 (p. 522).

CASE 20—HISTOPLASMOSIS IN A DOG—L. B. Sholl, D.V.M., East Lansing, Mich.

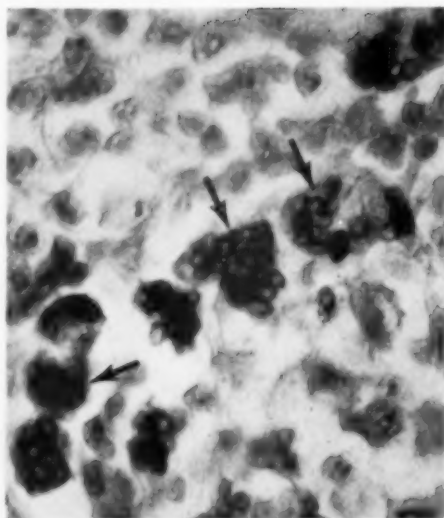
History.—Tissues were obtained from a 3-year-old female Cocker Spaniel which had exhibited weakness, dragging of the rear limbs, anorexia, and vomiting over a



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Fig. 20a—In this section of canine liver, *Histoplasma capsulatum* organisms can be seen in large phagocytic cells (arrows). Hematoxylin and eosin stain. $\times 1,200$.

period of one month. The mucous membranes were pale and there was a marked ascites. Laboratory findings were: hemoglobin, 8.1 Gm./100 cc.; erythrocytes, 3,240,000/100 cc. leukocytes, 18,550/100 cc. (neutrophils, 83%; segmented cells, 34%; nonsegmented cells, 49%; lymphocytes, 17%). At necropsy, the liver was enlarged and had numerous gray areas. The lobes of the lungs were congested and showed numerous gray nodular areas. The mesenteric lymph nodes were enlarged.

Comments (Moderator Jones).—In this section from the liver of the Cocker Span-



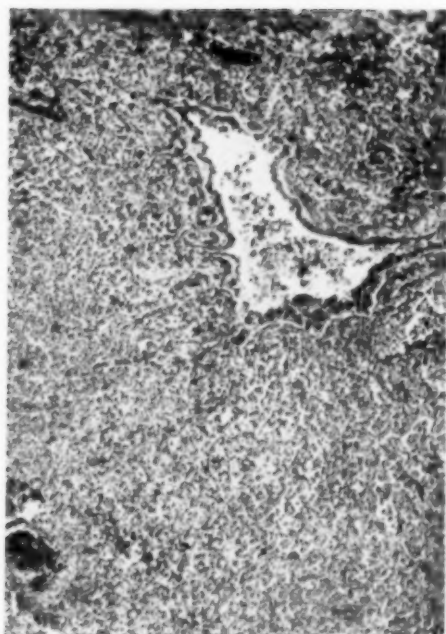
—Armed Forces Institute of Pathology
Fig. 20b—Section of canine liver showing *Histoplasma capsulatum* organisms in phagocytes. This section is stained to demonstrate the glycogen-containing capsule (arrows). Gridley fungus stain. $\times 1,080$.

iel, the architecture had been considerably altered due to the presence of large numbers of histiocytic cells (fig. 20a). These cells had abundant foamy cytoplasm and occasionally were arranged in granulomas, but were also seen diffusely distributed throughout the section. Under high power, these cells revealed numerous small, spherical organisms measuring up to approximately 3μ in diameter. They were characterized by a peripheral membrane inside of which was a clear zone surrounding, in turn, a central basophilic-staining body. The capsule was selectively stained by those stains for glycogen (fig. 20b) and were clearly shown by the Bauer technique and Gridley fungus stain.

Diagnosis.—The diagnosis was canine histoplasmosis.

CASE 21—EXPERIMENTALLY INDUCED HISTOPLASMOSIS IN A DOG—C. R. Cole, D.V.M., Ph.D., Columbus, Ohio

History.—This section (fig. 20a) is from the lung of dog A which was inoculated intratracheally with 1.0 ml. of a culture of *Histoplasma capsulatum* on the fifth day of a 16-day course of cortisone administration. Pyrexia and dyspnea developed on



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Fig. 21a—In this section of lung from dog A, experimentally infected with histoplasmosis, diffuse consolidation of the lung, as in the active disease, was produced by exposure to *Histoplasma* organisms plus cortisone therapy. Hematoxylin and eosin stain, $\times 75$.

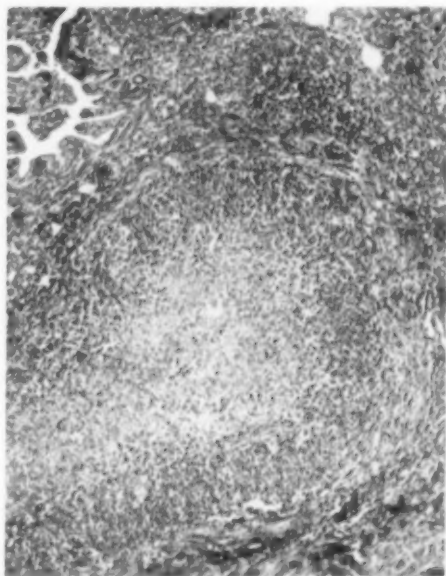
the sixth day and become progressively worse until death occurred on the eighteenth postinoculation day.

This section (fig. 21b) is from the lung of dog B which was given a series of six intratracheal inoculations of a culture without cortisone. Two inoculations of 1.0 ml. were given 35 days apart, followed by 2-ml. doses on the seventy-fifth, seventy-seventh, and seventy-ninth days. No signs of illness were seen during a seven-month observation period. Following this observation period, when dog B was given the same treatment as dog A, it developed a chronic cough and was destroyed after two and one-half months.

Comments (Moderator Jones).—There were two sections of lung on the microscopic slide. In one (fig. 21a), the alveoli were filled with histiocytes, hemorrhage, and necrotic debris, plus edema in some areas. There was a diffuse cellular reaction and no tendency for any of the lesions to be walled off. The predominant cell filling

the alveoli was a large histiocyte with abundant cytoplasm. In many of these cells, there were spherical organisms measuring up to 3μ in diameter. Most of these appeared as tiny central dots surrounded by a clear unstained halo which was, in turn, limited by a fine membrane. The capsular structure of these cells was particularly well stained with Gridley fungus stain.

In the other section (fig. 21b), the lesions were limited to areas of fibrosis and moderate consolidation, particularly around the major bronchi. These appeared to have obliterated some of the lymph nodes in this



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Fig. 21b—In this section of lung from dog B, experimentally infected with histoplasmosis, a discrete, encapsulated granuloma can be seen adjacent to the bronchus. No *Histoplasma* organisms were demonstrable. This animal received the same exposure as dog A, but without cortisone. Hematoxylin and eosin stain, $\times 75$.

region. In this section there was a frank circumscribed and encapsulated granuloma made up of histiocytic cells, occasionally with necrotic cell debris in the center of the lesion. The lesions were surrounded by a zone of lymphocytes and some fibrinous connective tissue. No organisms could be seen with certainty in these lesions, nor did the special stains demonstrate them.

In dog A, there was apparently little resistance to histoplasmosis (effect of cortisone), while in dog B there was almost complete immunity, at least effective immunity.

Diagnosis.—The diagnosis was experimentally induced histoplasmosis.

Discussion.—Dr. Cole described his experience in which 100 per cent of dogs could be infected by intratracheal inoculation of a suspension of "yeast" forms of *H. capsulatum*. In contrast, similar injection of mycelial forms did not produce infection. Dogs under cortisone therapy for 15 days, when injected with mycelial suspensions, have reduced resistance to infection, being as susceptible to mycelia forms as normal dogs are to yeast forms.

Bovine Stephanofilariar Dermatitis in Illinois

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Urbana, Illinois

There are few reports of bovine dermatitis due to the filarial nematode, *Stephanofilaria stilesi*. Dikmans¹⁻³ described it in cattle from Colorado, Wyoming, Nebraska, South Dakota, Virginia, and Louisiana, while Maddy⁴ found it in cattle from Oregon, Washington, California, Idaho, Nevada, Utah, Arizona, Colorado, Wyoming, Montana, and in Alberta, Canada. Maddy stated that this type of dermatitis is common in the western states, and that when it exists it often affects 80 to 90 per cent of the animals in a herd. Roberts⁵ found it in four South Dakota and two Illinois herds. It has also been reported anonymously¹² from Missouri. This paper describes a case in Illinois.

In September, 1951, a yearling heifer from east central Illinois was brought to the veterinary clinic of the University of Illinois for treatment. She was emaciated and had diarrhea. No diagnosis was established. The animal failed to respond to treatment. At necropsy,⁶ a 5- by 1-inch thickened area of skin with a hard, dry surface was observed on the abdominal

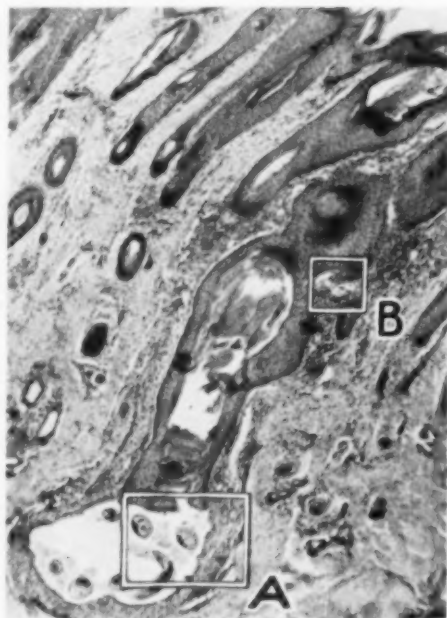


Fig. 1.—*Stephanofilaria stilesi* in a cyst at the base of a hair follicle in bovine skin. Zenker's, hematoxylin and eosin stain; $\times 44$.

midline anterior to the udder. This lesion was an incidental finding; it was not the primary cause of the animal's condition. A portion of the lesion was fixed in Zenker's fluid, sectioned, stained with hematoxylin and eosin, and examined microscopically. At the bases of some of the hair follicles were cystlike structures with thin cornified linings (fig. 1, 2, 3). Around follicle and cyst alike were moderate infiltrations of leukocytes including, in order of numbers, lymphocytes, neutrophils, and eosinophils. Within the cysts, in addition to a small amount of amorphous material, were nematodes which contained coiled larvae within their uteri (fig. 2). Several nematode larvae were also found scattered through the leukocyte-infiltrated perifollicular areas (fig. 4). These findings appear to suggest that after the larvae are released within the cystlike structure, they pass through its wall and migrate along the follicle toward the surface of the skin. The presence of larvae within the uteri of the adult females serves to distinguish *Stephanofilaria* from *Rhabditis strongyloides*, which occasionally invades the skin of cat-

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*The necropsy was requested by Dr. H. J. Hardenbrook of the Department of Veterinary Clinical Medicine and performed by Dr. P. D. Beamer of the Department of Veterinary Pathology and Hygiene, University of Illinois, Urbana.



Fig. 2—Enlargement of area A of figure 1 showing larvae in the uterus of a female worm. x 300.

tle,^{3,6,7} since *R. strongyloides* females deposit unembryonated eggs. Occasionally, larvae may develop from the eggs in the body of a female which has died, but these are fewer and a good deal larger in proportion to the size of the female's body than are the larvae of *Stephanofilaria*.

Four species of *Stephanofilaria* have been described from bovine skin lesions. They differ in geographic distribution and in the part of the host's body which they affect. *Stephanofilaria dedoesi* was described by Ihle and Ihle-Landenberg⁸ from Indonesia, where it causes a pruritic dermatitis known as "cascado." The lesions occur particularly on the sides of the neck, withers, dewlap, shoulders, and around the eyes. *Stephanofilaria assamensis* was described by Pande⁹ in India and Assam, where it causes a chronic dermatitis known as "hump sore" on the hump of Indian cattle (zebu). *Stephanofilaria kaeli* was described by Buckley¹⁰ from cattle in Malaya, where it causes a condition on the lower legs known as filarial sore. *Stephanofilaria stilesi* was described by Chitwood¹¹ from American cattle and has not been reported outside the United States and Canada. Its lesions occur predominantly on the ventral midline.

The life cycles of all these species are unknown. Presumably, the microfilariae are transmitted by biting flies or other arthropods, but probably not by bloodsuckers. No effective treatment is known. Dermatitis due to *S. stilesi* tends to be chronic and apparently seldom causes serious damage.

SUMMARY

Chronic dermatitis of the ventral mid-



Fig. 3—*Stephanofilaria stilesi* in a cyst at the base of a hair follicle in bovine skin, showing developing eggs in utero. Zenker's, hematoxylin and eosin; x 300.

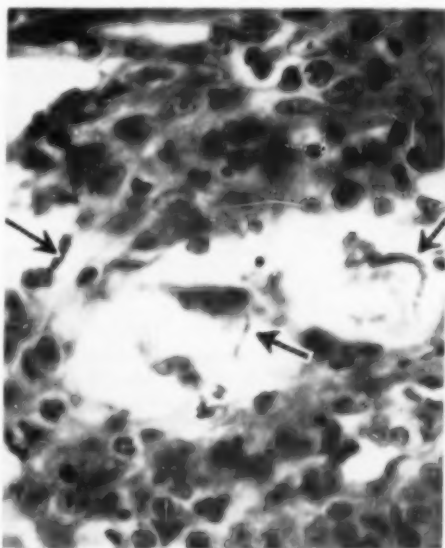


Fig. 4—Enlargement of area B of figure 1 showing 3 microfilariae in the zone of perifollicular leukocytic infiltration. x 690.

line due to the filarial nematode, *Stephanofilaria stilesi*, is described in an Illinois heifer. Photomicrographs illustrating the diagnostic characters are presented.

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¹²Anon.: Filarial Dermatitis in Cattle Caused by the Nematode *Stephanofilaria Stilesi*. Vet. Scope, Univ. of Missouri, 5, (1955): 8.

Bovine Rabies Without Negri Bodies

The reward of diagnostic diligence is demonstrated in a report by Dr. A. A. Case, of the University of Missouri, on an unusual disease of milk cows (*Sheep Breeder*, Sept., 1955).

When 6 cows sickened in four days in an area of Missouri where rabies was common, that disease was first suspected. At least 2 other cows died later, most of them with a similar five- or six-day illness, starting with tenesmus and complete loss of appetite and later resembling encephalitis. However, as Negri bodies were not found in the several brains examined, poisoning was also suspected. An exhaustive search which continued for two weeks revealed the possibility, but not the probability, of nightshade or other plant poisonings, poisoning from sprays used on the cows, moldy feed, and 1 cow was found

to have an unusual quantity of lead in her stomach. However, mouse inoculation finally proved positive for rabies. How these cows were infected could not be determined but none of the heifers which were with the cows, except when the cows were stabled, was affected.

Brucellosis from Animal Contact

A survey of brucellosis in man in Iowa, from 1951 to 1953, shows an increased percentage in males who contact animals and fewer persons infected by unpasteurized dairy products. Farm workers are more likely to become infected during the sow farrowing season. Of 720 patients, 363 were male farm workers, 158 were packinghouse employees, 20 were veterinarians, 12 were livestock dealers, and 8 each were rendering-plant employees and truckers.—*Am. J. Pub. Health*, Oct., 1955.

Hog Cholera Biological Products

During the first six months of 1955, nearly 440 million cc. of anti-hog cholera serum was produced in the United States. This is about half of the amount produced in a similar period in 1951, before the modified vaccines were released. During the same period in 1955, nearly 16 million cc. of simultaneous virus was sold, about a third of that produced in the same period in 1951. This virus would vaccinate perhaps 7 million pigs whereas over 16 million doses of nonvirulent hog cholera vaccine was sold in the same six months. Nearly 9 million doses were of modified live virus which must be used with serum, nearly 6 million doses could be used without serum, and nearly 1.5 million doses were inactivated vaccine.—*Inspection and Quarantine Branch, ARS, U.S.D.A.*, Aug. 12, and Sept. 19, 1955.

Vesicular Stomatitis Virus Carriers

Research with insects indigenous to Wisconsin indicates that about half of 28 species of biting Diptera were able to transmit the virus of vesicular stomatitis. The number of species that could be carriers, the indefinite incubation period, and the rapid loss of the ability to transmit the virus (1 to 3 days) indicated that the transfer was mechanical.—*Vet. Bull.*, Sept., 1955.

NUTRITION

The Effects of Feeding and Implanting Estrogenic Substances in Ruminants

DENNIS D. GOETSCH, D.V.M., M.S.

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DUE TO THE increased interest in hormones and hormone-like compounds being included in fattening rations of ruminants, it is important to appraise the current situation in respect to these compounds. The chemical substance which has received the greatest attention is diethylstilbestrol, a synthetic estrogen. This compound is not a hormone but is capable of producing many of the effects brought about by the female hormone, estradiol. Other synthetic compounds similar in action to diethylstilbestrol are dienestrol and hexestrol. The hormone, progesterone, has also been used in combination with diethylstilbestrol in an attempt to produce more rapid gains and increased feed efficiency.

Estrogenic substances in certain forage crops have been clearly demonstrated. Australian workers¹ have shown that many breeding and sterility troubles in sheep resulted from the presence of estrogens in subterranean clover and other pasture hays. Payne² reported the presence of estrogenic activity in certain grasses and hays found in this country.

Diethylstilbestrol implants have been used in poultry for a number of years. The use of this compound in poultry and the observation that pregnant heifers apparently take on a higher degree of finish than open heifers undoubtedly led to the first work using diethylstilbestrol implants in large animals.

EFFECT ON LAMBS

Growth and weight responses from diethylstilbestrol implants in lambs have not been consistent. Jordan,³ using suckling lambs, reported little or no increase in weight gain, whereas Perry⁴ reported a

significant increase in rate of growth under similar conditions. Both investigators, however, reported noticeable side effects, with the vulva becoming enlarged and vascular as if the lambs were in estrus. Increased mammary development occurred in both males and females but their fertility was not permanently impaired. Increased rate of growth and feed efficiency have been consistent in fattening lambs implanted with diethylstilbestrol.⁵⁻⁹ Side effects reported in these lambs include slightly lower dressing percentage, decrease in carcass grade, and less external and internal finish. An increase in the size of the accessory sex organs, particularly the bulbo-urethral glands, producing a swelling in the perineal region, has also been reported.⁶ This often resulted in prolapse of the rectum of these animals, undoubtedly due to straining in an attempt to urinate.

Bell *et al.*⁶ reported that lambs given diethylstilbestrol, either as implants or in the ration, gained more rapidly but had lower dressing percentages and lower grade carcasses than untreated lambs. However, lambs given diethylstilbestrol orally graded lower on foot and shrank more en route to market than did controls or those given diethylstilbestrol implants. At the Oklahoma station,¹⁰ although the weight gains and feed efficiency were increased by the addition of diethylstilbestrol to the ration, the carcass value was reduced by a slightly lower yield and by 30 per cent of the lambs being classified as yearlings by government graders.

EFFECT ON CATTLE

Numerous investigations have demonstrated an increase in growth rate and feed efficiency in fattening cattle implanted with diethylstilbestrol, dienestrol, and a combination of diethylstilbestrol and progesterone.^{10,11} Mammary and teat de-

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Presented Aug. 13, 1955, at the workshop conference of the American Society of Veterinary Physiologists and Pharmacologists, St. Paul, Minn.

velopment was evident among the treated male and female animals, while the heifers appeared to be in constant heat. Other undesirable side effects included a reduction in carcass grade and elevation of the tailhead with the resulting unevenness of the topline. Several cases of vaginal prolapse in treated heifers were also reported.

In a series of experiments with diethylstilbestrol implants in cattle on varying dietary regimens, Clegg and Cole¹² found that treated steers in the feedlot showed a greater growth response than treated heifers; also that treated heifers on pasture exhibited no increased gains over the controls.

The idea of giving diethylstilbestrol in the feed rather than as implanted pellets was conceived by Iowa workers in 1951.¹³ Their experiments resulted in an increase in rate of gain and feed efficiency and a reduction in feed cost without undesirable side effects such as were exhibited following the implantation of diethylstilbestrol. On the basis of their experiments, diethylstilbestrol, at the rate of 10 mg. per head daily, was approved for use in beef cattle rations by the Federal Food and Drug Administration. Significant weight gains following the oral administration of either diethylstilbestrol or hexoestrol were also reported by the Purdue workers,¹⁴ but undesirable side effects were produced (mammary development, elevated tailhead, relaxed lumbar region, slight decrease in carcass grade).

Kansas workers,¹⁵ reported only a slight increase in rate of gain, no increase in feed efficiency, and side effects similar to those following the implantations, when diethylstilbestrol was added to the ration of wintering beef heifers. Following slaughter, the ovaries were found to be smaller, with fewer developing follicles, than in untreated animals.

MISCELLANEOUS EFFECTS

Clegg and Cole¹² found that diethylstilbestrol implants produced a significant hypertrophy of the pituitary gland and adrenal cortex in all treated steers and heifers. The thyroid glands in treated steers were slightly larger than in control animals, whereas the thyroid glands of treated heifers were somewhat decreased in weight. Ovarian weights were un-

changed although fewer functional corpora lutea developed in the treated heifers.⁸

Numerous trials have indicated that diethylstilbestrol has little or no effect on the digestibility of feed, although Richardson *et al.*¹⁵ reported a consistent decrease in digestibility when it was fed. Nitrogen balance studies have shown a marked increase in nitrogen retention when ruminants were fed or implanted with diethylstilbestrol.^{8,17}

Field reports in Kansas and reports by Cairy¹⁸ have indicated that sows may abort or fail to conceive when they are allowed to follow cattle being fed diethylstilbestrol.

Residual estrogens in the meat of steers, wethers, and chickens treated with diethylstilbestrol and dieneestrol have been demonstrated by Stob *et al.*¹⁹ However, the quantity was far below the therapeutic level. Cairy¹⁸ has indicated the possibility of untoward effects from daily consumption, over long periods, of meat from diethylstilbestrol-treated animals.

The mode of action of diethylstilbestrol is still vague but it may increase weight gains and feed efficiency by its effect on the pituitary and adrenal glands since these glands have been shown to be hypertrophied in treated animals. The increased nitrogen retention could then be explained by the increased production of growth hormone and adrenal androgens. More study is needed to clarify these points.

SUMMARY

Diethylstilbestrol will increase rate of gain and feed efficiency whether administered as implants or in the ration.

Responses seem greater when animals are on a fattening ration than when on roughages.

The effects occur primarily during the first 30 days of treatment.

Age may be a factor; suckling lambs exhibited little response to implants.

Numerous side effects may be expected, but more from implanting than from feeding diethylstilbestrol.

Carcass quality is apparently diminished.

⁸Since this paper was presented, Hadlow *et al.*, Science, 122, (1955): 643-644, have reported that serious reproductive disturbances, including scrotal hernia and persistent estrus, have been encountered in a breeding colony of white mice as a result of inadvertent contamination of pelleted feed with diethylstilbestrol during processing in a mill previously used to prepare a cattle supplement that contained the drug.

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Zinc Deficiency and Parakeratosis

A review of research on the nutritional significance of zinc (*Nutr. Rev.*, Oct., 1955: 303) indicates how its association with parakeratosis in swine was discovered. A severe dermatitis in swine, resembling parakeratosis, developed when a processed peanut meal was the source of protein in the ration. However, pigs with access to clover or alfalfa were not affected. This dermatitis was then produced in ten weeks by adding 2.0 per cent bone meal or 1.5 per cent calcium carbonate to certain rations, but it could be prevented by the further addition of 0.02 per cent zinc carbonate. The therapeutic effect of this zinc was prompt, the appetite and weight gain being resumed within one week. A manganese deficiency in birds has been similarly produced by the addition of calcium phosphate.

Which ion aggravates the zinc deficiency is not known, but it might be presumed that calcium phosphate blocks the absorption of the zinc ion rather than competing with zinc in the body. Factors which may combine to produce parakeratosis are: a relatively low zinc content in the feed, increased quantities of calcium or phosphate, and relatively higher requirements of the pig for zinc. An induced zinc deficiency in rats also retarded growth and produced alopecia.

Cottonseed Meal in Poultry Rations.—Degossypolized cottonseed meal can replace 80 per cent of soybean meal in broiler and turkey starter rations without adversely affecting growth, but in the experiment reported, cottonseed meal alone reduced the growth rate. A combination of the two meals was more satisfactory than either alone.—*Poult. Sci.*, May, 1955.

EDITORIAL

The Today and Tomorrow of Veterinary Research

"The speed with which science has been moving during the past decade," says an editorial in *Science* (Oct., 1955), "is clearly associated with the science of instrumentation and the art of instrumentation. Twenty years ago a physicist was expert in experimental methods . . . in the whole field of science. Today . . . the tremendous development of equipment . . . has left him far in the rear," except in his own special field.

While this statement applies more to physicists and chemists than to "workers in the life sciences," the trend is also present in veterinary medicine.

This was well illustrated in an interesting resumé of progress made and anticipated, in veterinary research, recently presented to the Columbia V.M.A. in Washington, D. C., by Dr. Byron T. Shaw, administrator, Agricultural Research Service, U.S.D.A. The following thoughts were expressed by Dr. Shaw.

The livestock industry produces almost 65 per cent more red meat (27 billion lb.) than it did 20 years ago. This is associated with increased population as well as "a shift from high calorie foods to more protective foods."

In this 20 years, the per capita consumption of meat, fish, and poultry increased 28 per cent; of dairy products, other than butter—18 per cent; and eggs—46 per cent. This trend is expected to continue.

With limited additional farm and grazing lands available, livestock must be produced more efficiently. The increase in this efficiency, while estimated at 65 per cent since 1935, has not kept pace with the improved efficiency in grain production which is estimated at 275 per cent.

The sizeable loss from livestock diseases, perhaps 1.8 billion dollars annually with additional losses from parasites and insects, amounts to an estimated total of 2.7 billion dollars or one-sixth of the value of all livestock and poultry.

Urgent problems, such as presented by the so-called "mucosal complex—a series of one or several diseases now occurring in

about 20 states," tend to crowd out consideration of the more established diseases.

Foreign diseases are an increasing problem. Last year, for the first time, more cattle were exported by air than by ocean vessel. The planes must return and unless properly cleaned could furnish an environment for bringing back diseases or arthropod vectors of foreign diseases. We may have native vectors and lack only the new disease agent. Also, more than 90 per cent of poultry and about 75 per cent of horses are now imported by air. This rapid travel "outruns the normal incubation period of nearly all diseases."

We continue to study rinderpest and African swine fever abroad because of their clinical resemblance to domestic diseases, "for we could easily treat the wrong thing while a new disease spreads."

At the Plum Island Animal Disease Laboratory, foot-and-mouth disease virus is being cultured on beef and pork kidney tissue, making vaccine production possible at a great saving. When made from inoculated tongues of live cattle in Mexico, a half million head were used to furnish vaccine for 17 million animals.

Radioactive materials have given us new tools. Their value has been demonstrated in freeing the island of Curacao of screwworms by sterilizing and releasing the male flies. In work with plant rusts and smuts, irradiation has made it "possible to force mutations that may indicate what variants these fungi will produce in the next 25 or 50 years." Thus "those who are developing resistant plants [can] work several years ahead of the appearance of expected variants rather than several years behind them. If we could get similar results with . . . virus organisms that occasionally present us with new types or variants, veterinary medicine could take some giant strides."

"Isotope tracers are opening new avenues of research" which may "focus our attention more on prevention" than on "treatment and control of disease."

As to the future, it is difficult to say what constitutes enough research. Although

55 per cent of farm income is from animal products, much more is spent on plant than on animal research. Large animal research is expensive, involving long periods of time with no salvage return. Also, with more than 80 animal diseases being transmissible to man, more protective measures are necessary. More research on animal diseases is seriously needed. "We need to exploit . . . the fundamental principles of animal disease . . . through research with small animals."

Existing veterinary college curriculums, "aimed largely at turning out . . . practitioners," could offer more "opportunities for specialization in such fields as physiology, biochemistry, virology, and . . . breeding of livestock that are more resistant to disease." Better incentives to enter and remain in research work should be offered.

"We must build . . . solid dams of basic research that will permanently help to hold back the floods of animal disease."

Thoughts on Equine Abdominal Surgery

An article in this issue (p. 488) arouses memories of the days of horse practice and of a tremendous opportunity missed. The saying "too little and too late" could never apply more truly to any procedure in veterinary medicine than to equine abdominal surgery. Until a few decades ago, most of the surgery done by veterinarians was on the equine species. Yet many a noble animal had to suffer and die, often in acute pain, from a condition such as a twisted or obstructed gut when surgery was the only possible means of relief. Such surgery was prevented by a universal mental block which had been passed down from pre-asepsis days. The equine species was considered to be hypersusceptible to peritonitis. Result—"too little" such surgery attempted.

Then, about 1940, a successful cesarotomy in a mare was reported from a Colorado practice, and in the next two

years two successful laparotomies to relieve twisted intestines, from an Iowa practice, were done on routine calls in the pre-antibiotic days. But by then the colic-prone farm draft horse was disappearing. Surgical relief had arrived, but "too late."

In recent years quite a number of successful laparotomies, enterotomies, and enterectomies on horses and ponies have been reported. Most, if not all, of these were done in hospitals where relative asepsis is possible, and with the benefit of antibiotics.

However, the pathological conditions reported in this issue, which resulted from attempts at cryptorchidectomy by the inguinal method, suggests that perhaps it might still be well to relate some ideas which were applied to cryptorchids about a decade ago.

Here are the ideas and some of the reasons for them: Having failed to find a cryptic testicle in several pigs and having had one horse behave for years as a gelding, after removing only the descended testicle, it seemed that monorchidy was sufficiently common to at least serve as an alibi, when needed, for postponing completion of the castration; having, for various reasons, more frequently become aware of cryptorchidy only after the colt was cast, it seemed more logical to use the alibi when the second testicle or its gubernaculum could not be readily secured than to continue the search and risk injury to the unprepared patient by a semi-prepared operator; and having finally learned that laparotomy was feasible, cryptorchidectomy by that method seemed much more rational and simple for the horse, as well as for other species, than the awkward inguinal method.

After that decision only three cryptorchid horses, aged 2, 3, and 5 years, were encountered—all between 1943 and 1946. All were castrated by laparotomy under chloral hydrate anesthesia, with the assistance of two horsemen only, with only farmyard asepsis, without benefit of antibiotics, and without difficulty or postoperative complications.

A contemporary journal, *Veterinary Medicine*, announced its completion of a half century of effective literary contributions to the profession by publishing a splendid "50th Anniversary Issue" (November, 1955).

Congratulations from the JOURNAL.

CURRENT LITERATURE

Eructation in Adult Cattle

Application of the chronic intrathoracic vagal electrode technique to adult cattle is described. Modifications of the techniques described by Brody and Quigley proved useful for quantitation of motor events in the rumen and reticulum. A special technique for recording eructation at the cardia is described. Stimulation of the dorsal vagal trunk with moderate electrical stimuli was associated with increased rate of contraction of the rumen and increased eructation rate, even when the cardia was submerged 6 to 8 inches in water.—[H. E. Dziuk and A. F. Sellers: *Physiological Studies of the Vagal Nerve Supply to the Bovine Stomach. II. Studies on the Eructation Mechanism in Adult Cattle. Am. J. Vet. Res.*, 16, (Oct., 1955): 499-504.]

Immunization of Mink Against Clostridia

Toxin of *Clostridium botulinum*, type C, was prepared by growing the organism in physiological sodium chloride solution contained in cellophane bags which were immersed in a corn steep liquor medium. High yields of toxin were obtained by this method.

Formolized, alum-precipitated toxoid was prepared from toxin and utilized to immunize 56 mink which were marked for pelting.

Challenge of the immunized and of control mink showed decisively that the immunized animals were completely protected against challenge doses of toxin which killed all control animals within 36 hours.—[Austin E. Larsen, Paul S. Nicholes, L. P. Gebhardt: *Successful Immunization of Mink with a Toxoid Against Clostridium Botulinum, Type C. Am. J. Vet. Res.*, 16, (Oct., 1955): 573-575.]

FOREIGN ABSTRACTS

The White Blood Cell Picture in Cows

The aim of this investigation was to determine the normal white blood cell picture during various sexual conditions in sexually mature female cattle. This, it is believed, will serve as a basis for the study of various endocrine-conditioned sexual disturbances.

The physiological variations specially studied were those associated with estrus, pregnancy, and parturition.

Methods and techniques were subjected to statistical examination. Several factors appeared to affect the magnitude of the random error. The main factors seem, on the one hand, to be connected with a faulty dilution or pipetting of the blood and the distribution of the cells in the tube and, on the other hand, with faults made when

filling the chamber and counting the cells, as well as with an uneven distribution of the cells in the pipette and the chamber. The error of estimation was calculated from the following formula:

$$s \text{ equals } \frac{\sqrt{S(x-y)^2}}{2n}$$

where x and y represent the two separate values in duplicate determinations and n the number of duplicates.

Chapters five to nine of the report deal with the white blood cell picture of the mature cow normally, during the estrous cycle, in pregnancy, in connection with parturition, and during experiments with different sexual and gonadotrophic hormones and vitamin E on ovariectomized heifers.

The conclusions were:

a) Ovariectomy caused a clear stress effect. In 2 of 3 heifers, there was reduction in all types of leukocytes while in the third the changes ranged within physiological limits.

b) Estrogen treatment of ovariectomized heifers produced neutrophilia, followed by a rapid fall in initial values; lymphocytopenia followed by a slower increase to initial values; eosinopenia, with an irregular post-treatment course; and, in the majority of cases, an initial increase in the total white cell count followed by a drop to below initial values.

c) Progesterone alone did not produce a constant effect but, administered after estrogen treatment, it seemed to inhibit the lymphocytopenic and eosinopenic effect of estrogens.

d) Gonadotrophins had no effect on the white blood picture in ovariectomized heifers.

e) No uniform effect of vitamin E on the leukocyte count was obtained. While reproductive phenomena, like pregnancy and lactation, cause changes in the white blood cell picture, definite conclusions are not justified by this investigation.

—[Ralph Momberg: *The White Blood Cell Picture in Sexually Mature Female Cattle with Special Reference to Sexual Conditions. A Clinical and Experimental Study. The Royal Veterinary College, Department of Obstetrics and Gynecology, Stockholm.*]—H. E. KINGMAN, SR.

Purification of Tetanus Toxoid

Tetanus anatoxins produced by growing toxigenic strains in the medium of Mueller and Miller can be purified by adjustment to pH, with trichloroacetic acid, freezing, and thawing. The precipitated toxin dissolved in phosphate buffer is four times as antigenic as the untreated toxoid.—[J. L. Delsal and H. M. Chamsey: *The Selective Cryodenaturation Method for Purification of Tetanus Anatoxin. Arch. Inst. D'Hessarek (Iran)*, (1955): 15-17.]—J.P.S.

THE NEWS

Enrollment in Veterinary Medical Schools, 1955-1956

Each December the JOURNAL reports the enrollment and certain other pertinent data regarding the 19 veterinary schools in the United States and Canada.

Table 1 shows the relative amount of pre-professional college training of the 920 first-year

TABLE 1—Professional Training, U. S. Schools

	Years of preveterinary training			Degrees (%)
	2 yr. (%)	3 yr. (%)	4 yr. or more (%)	
Freshmen				
1952-1953	42	25	33	25.0
1953-1954	41	26	33	25.8
1954-1955	47	23	30	25.8
1955-1956	45	24	31	26.6

(freshmen) students at the 17 schools in the United States, the column on the right showing the percentage who have attained college degrees. There were 236 with bachelor and 5 with master degrees. This first-year group was selected from over 2,300 qualified applicants, a ratio of about 1:2.5, the same as a year ago.

The first-year class of 1,012 from the 19 schools is 14 less than a year ago but the total of 3,940 students is 47 more. The 179 graduate students who already have their D.V.M. degree (table 2) is 40 more than a year ago.

Equine Practitioners Association to Meet in Chicago

Program plans for the second regular meeting of the American Association of Equine Practitioners (*see* the JOURNAL, Sept., 1955: 276) to be held in Chicago on Dec. 16-17, 1955, have been completed. The first day will be business and scientific sessions at the La Salle Hotel. The second day will be devoted to surgical demonstrations at Rolling Acres Equine Hospital located on 159th St., South, 1 mile west of Cicero Ave., and 1 mile east of Harlem Ave., on U. S. Route 6.

Dr. W. F. Guard, Ohio State University, is program chairman and has arranged talks and panel discussions on such topics as radiation therapy, ultrasonic therapy, diagnosis and treatment of certain fractures in race horses, and conditions affecting foals. Dr. T. E. Dunkin, Chicago, is in charge of local arrangements for the meeting.

Veterinarians interested in equine practice are cordially invited to attend the scientific sessions and surgical demonstrations.

New England Association Elects Officers

The following officers were elected at the twenty-first annual meeting of the New England Veterinary Medical Association in Poland Spring, Maine, on October 2-5: Drs.

(Continued on page 539)

Table 2—Veterinary Student Enrollment for the Academic Year 1955-1956

Schools	Fresh.	Soph.	Jun.	Sen.	Spec.	Grad.	Total		
							1955	1954	Change
Alabama Polytechnic Institute	64	68	58	65	0	5	258	261	- 3
California, University of	52	48	44	51	5	12	212	207	+ 5
Colorado A. & M. College	71	65	61	60	0	8	265	255	+ 12
Cornell University	50	52	46	54	0	12	211	214	- 3
Georgia, University of	62	62	54	57	1	5	241	258	+ 3
Illinois, University of	55	52	52	29	1	10	157	146	- 9
Iowa State College	72	65	55	68	1	19	278	272	+ 6
Kansas State College	70	65	58	64	0	8	265	255	+ 10
Michigan State College	64	61	60	60	14	18	277	268	+ 9
Minnesota, University of	48	46	48	40	1	26	209	211	- 2
Missouri, University of	50	50	29	29	1	3	122	124	- 2
Montreal, University of*	29	20	21	19	0	0	89 ^a	84 ^a	+ 5
Ohio State University	72	70	69	67	1	19	298	297	+ 1
Oklahoma A. & M. College	41	56	51	52	0	5	145	140	+ 5
Pennsylvania, University of	54	49	46	45	0	7	201	195	+ 6
Texas A. & M. College	64	64	50	54	2	18	252	259	+ 15
Toronto, University of*	63	53	44	58	4	2	224 ^a	235 ^a	- 11
Tuskegee Institute	23	22	12	16	0	0	73	74	- 1
Washington, State College of	50	49	39	42	1	4	185	180	+ 5
Totals	1,012	955	857	905	32	179	5,940	5,893	+ 47

*The Canadian schools give a five-year course instead of requiring two years of preprofessional collegiate credit. The first year enrollment (57 at Toronto and 29 at Montreal) therefore are not included.



News From Washington



The Civil Service Commission announced (Federal Register, Oct. 26, 1955) **an increase in the minimum rate of pay for all veterinarians in the entering grade GS-7.** The new rate, effective October 23, means that veterinarians in that grade, and those hereafter employed by the U.S.D.A. with less than one year of experience will receive \$5,200 per annum (former entering salary \$4,930). After satisfactory completion of a six-month training period, such veterinarians are then eligible for promotion to grade GS-9 at \$5,440. Veterinarians with at least one year of experience are being employed initially by the U.S.D.A. at the \$5,440 rate. Six annual step increases in pay are provided in grade GS-9. A spokesman for the Department stated that opportunities for advancement to higher grades have never been better, since there are over 600 positions in grade 11 and above in the Agricultural Research Service to which veterinarians in Grade 9 may qualify through service and experience, as vacancies occur.

NOTE: This is the second **basic** increase the past five months specifically applicable to veterinary positions in grade GS-7 (see JOURNAL, July, 1955: 84). While it is a progressive step, taken to stimulate the procurement program, the AVMA still contends the minimum entering grade should be at some step in Grade GS-9.

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It is interesting to note the American Dental Association, at its 96th Annual Convention in October, voted, like the AVMA, **for voluntary participation** in Old Age and Survivors Insurance under Social Security. It will be recalled the House-passed social security bill (HR-7225) includes dentists and veterinarians but specifically excludes physicians. It is understood the subject of voluntary coverage for physicians will again be discussed when the A.M.A. House of Delegates meets in Boston in December. NOTE: HR-7225 is pending in the Senate Finance

Committee (see JOURNAL, Sept., 1955:277). Under existing law, optional social security coverage is extended the clergy.

★ ★ ★

The Bureau of Budget recently asked all federal agencies for comments on proposals which would give federal employees benefits of a combined Social Security and Civil Service retirement system coverage. It is expected legislation will be introduced in the next Congress for such a system. Highlights of proposals written into a **tentative draft for combined coverage** are: (1) Employees would pay the Civil Service retirement fund 3.5 per cent of all base pay below \$4,200 and 6 per cent of all above. In addition, they would pay the going Social Security rate of 2 per cent on the first \$4,200. (2) Annuities for retirees under age 65 would remain unchanged at present levels and be paid from Civil Service retirement fund. (3) Annuities for retirees over 65 increased an average of 8 per cent over present levels; paid partly from Civil Service fund and partly by Social Security. (4) Present Civil Service survivorship annuities for children eliminated in favor of social security survivorship benefits, latter said to be more generous. (5) Survivorship benefits for widows would commence on death of husband. Present Civil Service benefits start immediately only if there are dependent children, otherwise not until widow reaches age 50. (6) Employees retired for disability after a minimum of ten years' service would be guaranteed 40 per cent of base salary or the annuity he would have earned had he served to age 60, whichever is the lesser.

AVMA Office Address in Washington
Brig. General James A. McCallam (Ret.)
Room 109, 1507 M St., N.W., Washington 5, D.C.

(Continued from page 537)

S. W. Stiles, Falmouth-Foreside, Maine, president; Ernest H. Patchen, Milford, Conn., president-elect; and C. Lawrence Blakely, Boston, Mass., secretary-treasurer.

A total of 172—60 veterinarians of whom 42 were from Maine, 14 guests, and 98 women and children—attended the meeting, making it the most successful meeting attendance-wise in the history of this Association. The scientific session proceeded as reported in the November JOURNAL (pp. 464-466), except that Dr. Tucker did not discuss mastitis control.

s/H. L. CHUTE, *Resident Secretary.*

World Congress on Fertility and Sterility

The Second World Congress on Fertility and Sterility will meet in Naples, Italy, May 18-26, 1956. It is sponsored by the International Fertility Association. Participants will include physicians and veterinarians from all countries. Professor T. Bonadonna of the Universities of Camerino and Milan, is in charge of organization of the veterinary section.

Conference on Mucosal Diseases of Cattle

At the invitation of the Agricultural Research Service, about 50 representatives of the cattle and allied industries and veterinarians met in Chicago on October 28. The problems posed by the "mucosal diseases" were discussed by Drs. B. T. Simms, director of livestock research, ARS; W. R. Pritchard, Purdue University; Rue Jensen, Colorado A. & M. College; and Lt. Col. F. D. Maurer, Armed Forces Institute of Pathology, Washington, D.C. Dr. C. D. Van

Houweling, director of Livestock Regulatory Programs, ARS, presided. Mr. Walter Lloyd, secretary of Livestock Conservation, Inc., was designated by the livestock groups to keep them informed on developments pertaining to these diseases.

STUDENT CHAPTER ACTIVITIES

For copy deadline, see "Among the States and Provinces"

Missouri Chapter.—When the University of Missouri Student Chapter of the AVMA met on October 10, Dean Groth introduced the following guest speakers: **Drs. Niel W. Pieper**, Middletown, Conn., who discussed the purpose and functions of the AVMA Council on Education; and **James E. Greene**, Alabama Polytechnic Institute, Auburn, who showed slides taken on a recent trip to Europe. Other guests at this meeting were Drs. R. E. Rebrassier, Ohio State University, Columbus; and Fred B. Ogilvie, small animal practitioner of Kansas City, Kan.

The first of the Chapter's fall activities was the annual smoker on September 28.

s/GARLAND LINDSEY, *Secretary.*

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Washington Chapter.—Open house concluded the spring semester activities at Washington State College. More than 1,000 guests visited the veterinary buildings and observed the interesting and informative displays on all phases of veterinary medicine.

During the annual spring all-campus songfest, the male chorus of the Chapter won the gold cup for first place in the men's division.

During the summer, a committee from the Chapter worked in conjunction with the Wash-



The Washington State College Student Chapter male chorus which won first place in the 1955 all-campus songfest.

ington State Veterinary Medical Association to set up a display booth at the State Fair in Puyallup (see p. 553). This was a wonderful public relations project since more than 100,000 people viewed the display.

The following officers will serve the Chapter during the fall semester: George Stabenfeldt, president; Donald Jenkins, vice-president; Joan Carey, secretary; Hugh Maycumber, treasurer; Richard Long, athletic chairman; and Winthrop Dale, publicity chairman. Class representatives to the Executive Council from the senior, junior, sophomore, and freshman classes are, respectively: Bill Tavenner, Frank Fall, Donald Crimmins, and Duncan McLean.

At the first meeting this fall, Dean Stone introduced the faculty and the new freshmen; **President George Stabenfeldt** gave his report as representative to the AVMA convention in Minneapolis in August; and **Mr. A. C. Carpenter, C.P.A.**, spoke on the many pitfalls in finances and bookkeeping which confront the practicing veterinarian.

Many Chapter members are now busy working on the next edition of our student publication, *The Western Veterinarian*. This publication is unique in that it is self-supporting and is published without the aid of commercial advertising.

S/WINTHROP DALE, *Publicity Chairman*.

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Minnesota Chapter.—The first meeting of the fall semester of the University of Minnesota Student Chapter of the AVMA was the annual smoker in honor of the freshmen. Dean Thorp introduced the faculty members, and the upper classmen, "big brothers," introduced their "little brothers" of the freshman class. The meeting closed with refreshments and a social mixer.

S/D. C. SWACINA, *Secretary*.

WOMEN'S AUXILIARY

Public Relations Activity for Auxiliaries.

Radio, like the horseless carriage is here to stay, in spite of the increasing popularity of television. In addition to entertainment, radio brings us the latest news and programs of educational value. Veterinarians and their wives are daily made aware of the need of their clients for information on the prevention and control of diseases of livestock and pets, also on problems of breeding, sanitation, and livestock management. Local radio stations, the AVMA radio scripts, veterinarians, and the women's auxiliaries add up to the answer

on how the profession can provide the information the public needs and wants.

Most radio stations have farm programs and their directors are eager to allow time for a discussion of timely veterinary topics. The AVMA has the seven-minute scripts, one for each week of the year, prepared by staff veterinarians and checked for technical accuracy. Veterinarians, busy as they are, have a few minutes to spare to further good public relations for the profession. Auxiliaries have the organization to contact local radio stations, secure AVMA scripts, and make appointments for veterinarians to appear. The result — a valuable service to the public and to the profession.

In the spring of 1955, the radio committee of the Women's Auxiliary to the AVMA was appointed to work with the AVMA office in acquainting auxiliaries with the public relations potential of the AVMA scripts and in assisting auxiliaries or individuals wishing to start a radio project.

When the committee made its report during the meeting of the Auxiliary house of representatives in Minneapolis, emphasis was given to the promotion of the scripts as a project for state auxiliaries. This does not mean that regional or county auxiliaries, or even individuals, must wait for action on a state-wide basis. In many instances, individual auxiliary members have recognized the public relations potential of the scripts, and on their own initiative have obtained time on the air over their local stations. The efforts of one individual in her town have kindled interest that resulted in her regional and, later, her state auxiliary adopting a radio project.

County and regional auxiliaries with limited finances, which want to adopt a worthwhile project, should give serious consideration to a radio project. It can be carried on with a minimum of expense and, after the initial steps have been taken, a minimum of effort on the part of members. The radio committee has material ready which gives step-by-step procedures. Individuals or auxiliaries wishing such information should contact the AVMA office or any of the committee members.

An auxiliary officer in Illinois, who was gathering data on her state's radio project to be included in the committee's report in Minneapolis, wrote to the various stations which use the scripts. She received in return cordial letters of appreciation from station managers for the efforts of the auxiliary and the participating veterinarians. The letters were proof that the profession's public relations in her state had been polished to an even brighter luster.

S/MRS. J. J. FISHLER, *Elkhart, Ind.*

MRS. H. E. SCHWERMANN, *New Uhm, Minn.*

MRS. L. J. MILLER, *Lincoln, Ill.*

No invitation is necessary to become a member of the Women's Auxiliary to the AVMA. We welcome all interested women. The dues are only \$2.00 per year. Just write to:
Mrs. C. M. Rodgers, membership secretary,
Blainville, Ill.

Kentucky Auxiliary.—The winter meeting of the Women's Auxiliary to the Kentucky Veterinary Medical Association will be held December 5-6 at the Ken-Lake Hotel in Hardin, with Mrs. Tom Maddox presiding. The program includes a morning coffee and get-



Mrs. Tom Maddox, president of the Women's Auxiliary to the Kentucky V.M.A.

acquainted session, luncheon, business meeting, bridge and canasta party, the annual banquet, and sight-seeing tours of the area surrounding the world's largest man-made lake, Kentucky Lake.

s/MRS. NELSON POTT, *Publicity Chairman.*

Missouri Auxiliary.—The Women's Auxiliary to the Missouri Veterinary Medical Association met on Oct. 3, 1955, in Columbia, with Mrs. Glen Dunlap of Kansas City presiding. Mrs. A. W. Uren, of Columbia, the entertainment chairman, introduced Dr. C. E. Leman, pastor of the First Christian Church in Columbia, who told of his trip to Europe this past summer.

Mrs. Paul Spencer, Jefferson City, reported on the annual meeting of the Women's Auxiliary to the AVMA held in Minneapolis last August. The student loan fund was reported by its chairman, Mrs. A. W. Uren, to have a balance of \$657. The executive board recommended that \$25 be given to the memorial fund of the AVMA Women's Auxiliary in memory of Dr. John L. Wells who passed away last August.

s/MRS. L. L. RICE, *Secretary.*

New York Auxiliary.—On September 15, the annual luncheon and business meeting of the Women's Auxiliary to the New York State Veterinary Medical Society was held at

the Statler Hotel in New York City. Mrs. C. E. DeCamp presided. The guest of honor was Mrs. A. E. Coombs, president-elect of the AVMA Auxiliary, who spoke briefly on the aims and growth of that organization.

The yearly reports were issued in pamphlet form to the members. It was reported that although not organized until 1948, the New York State Auxiliary now has a membership approximately 50 per cent of its potential.

The officers for 1956 are: Mrs. O. E. Helms, East Randolph, president; Mrs. H. K. Fuller, Interlaken, president-elect; Mrs. Lincoln E. Field, Middleburgh, secretary; Mrs. Lyle S. Compton, Clymer, treasurer; and Mrs. Orrin P. Jones, Norwich, membership chairman. The 1956 meeting is scheduled for September 19-21, at the Concord Hotel on Kiameshia Lake in the Catskills.

s/(MRS. O. E.) RUBY L. HELMS, *President.*

Michigan State University Student Auxiliary.—The Women's Auxiliary to the Michigan State University Student Chapter of the AVMA is fortunate to have an exceptional educational program, with excellent speakers, planned for the school year. Dean C. F. Clark and Dr. W. O. Brinker helped set up the program which includes classes on the care of medical instruments, office management, assisting in surgery, and various laboratory techniques.

In addition to the educational classes, members enjoy social meetings once a month.

The following officers will serve the Auxiliary this fall: Mrs. Ann Kurilchik, president; Mrs. Peggy Studer, vice-president; Mrs. Jeanine Asquith, secretary; Mrs. Marion Trotman, treasurer; Mrs. Jacquelyn Haase, publicity chairman; and Mrs. Evelyn Plymale, social chairman. Mrs. C. F. Clark, Mrs. J. P. Newman, and Mrs. C. W. Titkemeyer, wives of faculty members, are club advisors.

s/MRS. JACQUELYN HAASE, *Publicity Chairman.*



The exhibit of the Minnesota Student Chapter Auxiliary at the AVMA meeting in Minneapolis.

APPLICATIONS

Applicants—Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative Bylaws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., the names of applicants residing within the jurisdictional limits of the constituent association shall be published once in the JOURNAL.

The following applicants have been certified as members of the constituent association that has jurisdiction over the area in which the applicant resides. This certification was made by the secretary of the constituent association in accordance with Section 2, Article X, of the Administrative Bylaws.

- ALBERT, WALTER G.
2512 Wishkah Blvd., Aberdeen, Wash.
M.R.C.V.S., University of Liverpool, England, 1950.
- ADAMSONS, KARLIS E.
Medina, N. Dak.
D.V.M., University of Latvia, 1941.
- ALTSCHULER, MILTON
Salem Church Rd., R.F.D. 1, Newark, Del.
D.V.M., National Veterinary School, Alfort, 1951.
- ANDERSON, PAUL L.
901 W. 8th St., Sioux City, Iowa.
D.V.M., Tuskegee Institute, 1950.
- BAZAR, ANTHONY
231 Windermere Ave., Toronto, Ont.
D.V.M., Veterinary College, Czechoslovakia, 1926.
- BELLER, JEROME
Courtland, Va.
D.V.M., Middlesex University, 1946.
- BENEDICT, ROBERT L.
Midway Veterinary Clinic, Rt. 3, Caldwell, Idaho.
D.V.M., Colorado A. & M. College, 1955.
- BOND, ELIHU
250 Central Ave., White Plains, N. Y.
D.V.M., Middlesex University, 1942.
- BONN, LAWRENCE J.
Plainfield Rd., Joliet, Ill.
D.V.M., Middlesex University, 1944.
- BRANDT, GEORGE H.
206 E. Wade St., Wadesboro, N. C.
D.V.M., Middlesex University, 1945.
- EATON, L. G.
Rudolph, Wis.
D.V.M., Ontario Veterinary College, 1950.
- FENTON, ALBERT B.
Malbrook, Falls Church, Va.
D.V.M., Middlesex University, 1944.
- FERGUSON, DONALD E.
1912 N. 4th St., Pasco, Wash.
D.V.M., Washington State College, 1943.
- GILBERT, ARTHUR A.
615 Airline Blvd., Portsmouth, Va.
D.V.M., Middlesex University, 1944.
- GURSHA, HAROLD B.
31 Wellesley Ave., Needham Heights, Mass.
D.V.M., Middlesex University, 1945.

- HARADA, ROY R.
P. O. Box 918, Honolulu, Hawaii.
D.V.M., Middlesex University, 1946.
- HILLS, EDWARD J.
Box 203, Harrison, Ark.
D.V.M., Middlesex University, 1944.
- JACKSON, LEWIS L.
2872 Woodside Dr., Jackson, Miss.
D.V.M., Texas A. & M. College, 1939.
- LAWRENCE, ROBERT P.
2207 W. 183rd St., Homewood, Ill.
D.V.M., Middlesex University, 1944.
- LEACH, JAMES H.
Fort Hill Rd., Eastham, Mass.
D.V.M., Middlesex University, 1943.
- MATTHEWS, MASON L., Jr.
346 Barbara Drive, San Antonio, Texas.
D.V.M., Texas A. & M. College, 1948.
- MERRIMAN, GEORGE M.
855 E. Burroughs, Alcoa, Tenn.
D.V.M., Michigan State College, 1943.
- MUNRO, DAVID A.
97 Grandview Ave., Morgantown, W. Va.
D.V.M., Ontario Veterinary College, 1941.
- OKONE, HAROLD M.
6001 Melton Rd., Gary, Ind.
D.V.M., Middlesex University, 1945, and
D.V.M., National Veterinary School, Alfort, 1952.
- SCHOLTZ, EUGENE R.
286 N. Middletown Rd., Pearl River, N. Y.
D.V.M., New York State Veterinary College, 1947.
- SCHRENZEL, E. JOHN
3008 Richmond Highway, Alexandria, Va.
D.V.M., Middlesex University, 1946, and
D.V.M., National Veterinary School, Alfort, 1951.
- TONKEN, BERNARD W.
Box 217, Vulcan, Alta.
D.V.M., Ontario Veterinary College, 1954.
- TRUDEAU, CLEMENT
2367 Sylva Clapin, St. Hyacinthe, Que.
D.V.M., University of Montreal, 1952.
- VAN GORDER, LLOYD F.
P. O. Box 396, Arcadia, Mo.
D.V.M., Ontario Veterinary College, 1949.
- WHENHAM, GERALD R.
5105 54th St., Westlock, Alta.
D.V.M., Ontario Veterinary College, 1949.
- WIESE, R. P.
Garretson, S. Dak.
D.V.M., Chicago Veterinary College, 1917.
- WINTERS, RICHARD W.
807 Pere Marquette Bldg., New Orleans, La.
D.V.M., Texas A. & M. College, 1944.

Applicants—Not Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative Bylaws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., notice of all applications from applicants residing outside of the jurisdictional limits of the constituent associations, and members of the Armed Forces,

shall be published in the JOURNAL for two successive months. The first notice shall give the applicant's full name, school, and year of graduation, post office address, and the names of his endorers.

First Listing

DAUGHTREY, FRANKLIN D.
311 S. Gilbert Ave., LaGrange, Ill.
D.V.M., Ohio State University, 1929.
Vouchers: R. D. Chadwick and W. L. Hays.
MALONE, GEORGE P.
Porcupine, S. Dak.
D.V.M., Colorado A. & M. College, 1953.
Vouchers: J. V. Norris and F. N. Carlson.
SANDSTEDT, HARALD G.
Kyrkogat 9, Mjölby, Sweden.
D.V.M., Royal Veterinary College, Sweden,
1934.
Vouchers: F. Nilsson-Sevelius and I. Alstrom.

Second Listing

ELLIS, PETER R., Pan American Foot-and-Mouth
Disease Center, Caixa 589, Rio de Janeiro,
Brazil.
HEIDELBAUGH, NORMAN D., 7272nd USAF Hos-
pital, APO 231, New York, N. Y.
SPRINKLE, DAVID G., 1707 E. 5th St., Vancouver,
Wash.
TISHMAN, SIDNEY, 4800 Ritchie Highway, Balti-
more, Md.

Graduate Applicants

The following are graduates who have recently received their veterinary degree and who have applied for AVMA membership under the provision granted in the Administrative Bylaws to members in good standing of student chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

First Listing

Michigan State University

ANDERSON, JAMES H., D.V.M.
Box 27A, Donnellson, Iowa.
Vouchers: F. B. Young and J. H. Krichel.
FAY, GORDON K., D.V.M.
1123 Lapeer Ave., Port Huron, Mich.
Vouchers: T. J. Skinner and R. M. Scott.

Correction.—Through error, the University of Missouri was not credited with having 100 per cent of its class of 1955 apply for membership in the AVMA in the issues of the JOURNAL in which the names of 1955 applicants were published. Actually, of the six classes graduated by the School of Veterinary Medicine of the University of Missouri, five applied, 100 per cent, for membership in the AVMA at the time of graduation. In so far as the sixth class is concerned, all members have, since graduation, become members of the AVMA.

University of Montreal

JOHANSSON, ARNE B., D.V.M.
15 Martin Rd., St. Hubert, Que.
Vouchers: H. S. MacDonald and J. M. Baker.

University of Toronto

MCLEAN, WILLIAM J., D.V.M.
6 Sophia St., E., Barrie, Ont.
Vouchers: D. L. T. Smith and J. A. Henderson.

Texas A. & M. College

DANCER, EARL W., JR., D.V.M.
P. O. Box 565, Columbus, Texas.
Vouchers: F. L. Gunn and W. G. Mode.

Tuskegee Institute

WILLIAMS, LAWRENCE B., D.V.M.
639 Carroll Ave., St. Paul, Minn.
Vouchers: G. W. Cooper and E. T. Braye.

Second Listing

University of California

CONSTANTINE, DENNY G., D.V.M., Newton Field
Station Unit, Communicable Disease Center
Activities U. S. Public Health Service, New-
ton, Ga.

Colorado A. & M. College

BLACKBURN, BRUCE W., D.V.M., Fairfield, Neb.

Iowa State College

HYMAS, CHARLES J., D.V.M., 936 A St., Orland,
Calif.

Michigan State University

ENGEL, ERNEST F., D.V.M., 107 Center St., Mt.
Carroll, Ill.

University of Minnesota*

JOHNSON, DEAN F., D.V.M., Rt. 3, Mankato,
Minn.
STEVENS, CHARLES E., D.V.M., 3316 4th Ave.,
S., Minneapolis, Minn.

University of Montreal

RUSICH, ERNANNO STELIO, D.V.M., 11145 68th
St., Edmonton, Alta.

Oklahoma A. & M. College

FREEMAN, C. PERRY, D.V.M., 3057 Oxford, Jack-
son, Miss.
HUTTON, FRED L., D.V.M., 949 North Winter,
Salem, Ore.

Texas A. & M. College

CARLOSS, FRANK R., D.V.M., No. 8 Peggy Ann
Ave., Alexandria, La.
WILLMANN, EDGAR R., D.V.M., 520 E. Myrtle
St., San Antonio, Texas.

University of Toronto

MCISAAC, J. C., D.V.M., Box 175, Unity, Sask.

Tuskegee Institute

HENDERSON, GORDON L., D.V.M., Rt. 6, Box 245,
Terrell, Texas.

U. S. GOVERNMENT

Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U.S.D.A. Agricultural Research Service are reported as of Oct. 21, 1955.

NEW APPOINTMENTS

James E. Cook, Fort Worth, Texas.
Marion R. Flowers, Kansas City, Kan.
Theodore R. Geci, Jacksonville, Fla.
Robert L. Jones, Nashville, Tenn.
Werner Langheinrich, Green Bay, Wis.
Harold J. Morgan, West Union, Iowa.
Stasys Skripkus, New York, N. Y.
Hans P. Vinkel-Jensen, St. Louis, Mo.

MILITARY FURLONGS

Dale C. Gigstad, South St. Joseph, Mo.
Jerry J. Hosek, Fort Worth, Texas.
James T. Yoder, Des Moines, Iowa.

TERMINATION

Perry M. Boyd, Jr., Mexico City, Mex.

RESIGNATIONS

James C. Dunlop, St. Louis, Mo.
Donald G. DeValois, St. Paul, Minn.
Donald F. Hodgson, Omaha, Neb.
Kenneth L. Kuttler, Beltsville, Md.
William R. Miller, Lincoln, Neb.

RETIREMENTS

Adam A. Husman, Raleigh, N. Car.
Jose L. Oyarzabal, New York, N. Y.

TRANSFERS

Charles R. Adams, from Lake Charles, La., to Moultrie, Ga.
Charles L. Davis, from Denver, Colo., to Washington, D.C.
Herschel D. Dorman, from Baton Rouge, La., to Houston, Texas.
Nelse P. Thiele, from Tecumseh, Neb., to Lincoln, Neb.
William J. Waters, Jr., from Suffolk, Va., to Gaffney, S. Car.

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Drs. DeCamp and McKee Appointed Poultry Pathologists.—Recently, the Inspection Branch, Poultry Division, Agricultural Marketing Service, appointed Drs. Daniel DeCamp (KSC '29) and G. S. McKee (OSU '33) to fill poultry pathologist positions in the Washington office.

Dr. DeCamp, who will serve as a coordinator of postmortem inspection and will evaluate material from laboratory reports as to application at field levels, has been employed for 21 years by the Federal Poultry Inspection Service. He served as inspector in charge at various poultry processing plants, inspector of live poultry in New York market terminals and, more recently, as assistant area supervisor in the eastern region.

Dr. McKee, a major in the U. S. Air Force Reserve, and a prominent veterinary practitioner for a number of years, has served as inspector in charge at one of the official poultry processing plants in Pittsburgh, Pa., for the past two years. His new duties will include operating the diagnostic laboratory for the Inspection Branch and assisting in the

development of visual aids, such as pictures or color slides of diseased tissues for use in training poultry inspectors.

s/ROY E. WILLIE.

AMONG THE STATES AND PROVINCES

The deadline for news copy is the 24th of the month, two months preceding the month of issue

Alabama

Changes in Personnel at Veterinary School.—The School of Veterinary Medicine, Tuskegee Institute, announces the following recent faculty changes: W. C. Bowie (KSC '47) returned from Cornell University where he received his Master's degree; Louis Singleton (TUS '55), employed on small animal staff; E. T. Braye (TUS '52), transferred from small animal to large animal medicine; M. V. Weathersby (TUS '53), resigned to enter private practice in D'Lo, Miss.; and C. L. Belfield (TUS '54), resigned to accept employment with the ARS, Department of Meat Inspection, in California.

Arizona

Central Association.—The September 13 meeting of the Central Arizona Veterinary Medical Association was held at the Steak House in Phoenix, with Dr. D. L. Fox as host. Dr. B. Mariassy, president, conducted the business meeting.

At the October 11 meeting, held at the Arizona Manor in Phoenix, Dr. Jack Fuller was host. Dr. Frank Benton, of the small animal committee, moderated a panel of case reports presented by Drs. George Calderwood, Tempe; D. W. Hott and T. T. Smith, Phoenix; and Dr. Fuller reported on minor revisions of the suggested minimum fee schedule for large animal services. This was followed by a discussion on how to best determine that proper tuberculin testing of cattle is being done.

s/KEITH T. MADDY, Secretary.

California

Changes in Personnel at Veterinary School.—The School of Veterinary Medicine, University of California, announces the following faculty appointments: P. E. Kelly (COR '55), L. Hutcherson, (COL '55), and B. J. Smith (COL '55), to clinical medicine and surgery; Rebecca B. Taylor (MSC '46), to anatomy; B. A. Rasmussen (COR '55), to genetics; R. M. Lee (CAL '55), to parasitology; R. W. Wichmann (CAL '55), to poultry pathology; Andre G. J. Boidin (ALF '53), to pathology; and C. D. Meredith (Onderstepoort, S. Africa '53), to physiology.

Resignations include: D. V. Zander (COL

'50), to accept a commercial position, and J. I. Denton (ISC '42), to enter private practice.

Colorado

State Association Officers.—At the annual meeting of the Colorado Veterinary Medical Association in Steamboat Springs on September 16-18, the following officers were elected: Drs. D. R. Mackey, Greeley, president; H. J. Hill, Fort Collins, president-elect; and G. H. Gilbert, Arvada, secretary-treasurer.

s/G. H. GILBERT, *Secretary.*

• • •
Dr. Childs Selects "Deputy State Veterinarians."—Dr. John W. Childs, newly appointed state veterinarian of Colorado, has named a veterinarian from each of the ten district societies in the state to aid him in the regulation work necessary to his office. These men will be paid for their time and mileage when called upon by Dr. Childs's office. The Agricultural Commission of the State Department of Agriculture has designated these men as deputy state veterinarians and has vested them with the authority necessary to conduct such work as may be directed by the office of the state veterinarian.

A meeting was held at Colorado A. & M. College on September 12 for the purpose of acquainting this group with laboratory procedures and the methods of submitting laboratory specimens.

s/G. H. GILBERT, *State Secretary.*

• • •
Dr. Harrison Appointed to Veterinary Examining Board.—Dr. John W. Harrison of Longmont was recently appointed to fill the vacancy on the Board of Veterinary Medical Examiners created by the resignation of Dr. A. N. Carroll of Pueblo. At a meeting of this Board, held in conjunction with the meeting of the State V.M.A. in September, Drs. N. J. Miller, Eaton, was elected president; John W. Harrison, treasurer; and V. D. Stauffer, Arvada, secretary. This Board has not announced a definite date when examinations will be given to applicants for license, but it will probably be in the latter part of December or early in January.

s/G. H. GILBERT, *State Secretary.*

• • •
Changes in Personnel at Veterinary School.—The School of Veterinary Medicine, Colorado A. & M. College, announces the following recent faculty appointments: Jean C. Flint (COL '32), associate professor, Department of Pathology and Bacteriology; A. W. Elting (WSC '44), Department of Physiology; L. C. Faulkner (COL '52) and B. O. Woodworth (COL '55), assistant professors, Department of Surgery and Clinics.

Departures include: R. H. Jourdan (COL '46), resigned to enter private practice; W. D. Carlson (COL '52), on leave, studying for the

Ph.D. degree in radiology; and N. H. Booth (MSC '47), on leave, studying for the Ph.D. degree in pharmacology.

Connecticut

Fairfield County Association.—The Fairfield County Veterinary Medical Association held its October 12 meeting at Chimney Corners Inn in Stamford. The guest speaker was **Dr. William G. Magrane**, Mishawaka, Ind., who discussed canine ophthalmology.

s/WILLIAM R. LEGGETT, *Secretary.*

Delaware

New Castle County Association.—The following officers were elected at a recent meeting of the New Castle County Veterinary Medical Association: Drs. Arthur P. Coogan, Wilmington, president; and E. J. Hathaway, Wilmington, secretary-treasurer.

At the past several regularly scheduled meetings there have been discussions of the brucellosis vaccine research program at the University of Delaware, by **Drs. James Kakavas** and **Katherine Yaw**; and a symposium on the agricultural research program at the University, presented by staff members, with **Dr. Morris Cover** presiding.

s/E. J. HATHAWAY, *Secretary.*

District of Columbia

District Association.—The annual meeting of the District of Columbia Veterinary Medical Association, the first all-day meeting attempted by this group, was held October 11 at the Armed Forces Institute of Pathology. It featured the following speakers and their subjects: **Drs. Warren G. Hoag**, Blacksburg, Va. (mucosal-like disease of animals in Virginia); discussion by **Lt. Col. Fred D. Maurer**, V.C., U.S. Army; **Robert J. Huebner** (M.D.), National Microbiological Institute, National Institutes of Health, Bethesda, Md. (animal viruses in cancer research); **Robert A. Conrad**, commander, M.C., U. S. Navy, Bethesda, Md. (effects of radioactive fallout on the biological system); **Byron T. Shaw**, Washington, D. C. (animal disease research); **Brig. Gen. J. A. McCallam** (ret.), Washington, D. C. (activities of the Washington Office of the AVMA); **Lt. Robert M. McCully**, V.C., U.S.A.F. (urethral obstruction in the male cat); **Harlan E. Jensen**, University Heights, Ohio (small animal surgical techniques); **William I. Gay**, National Institutes of Health, Bethesda, Md. (femoral head prosthesis); **Jacob C. Siegrist**, Bloomfield, N. J. (corticoid products).

At the evening banquet in the Walter Reed Officers Club, the Association presented certificates of merit to **Drs. Alexander E. Wight** (HAR '97), leader of the federal campaign

to eradicate bovine tuberculosis from the United States; William M. MacKellar (NYC '99), in charge of the federal program for eradication of cattle tick fever; Harry W. Schoening (UP '07), internationally famed for his research on rabies and foot-and-mouth disease, and representative of the United States at many international veterinary congresses; A. B. Crawford (GWU '14), who developed standard antigens for diagnosis of brucellosis; and David E. Buckingham (UP '93), practitioner active in District veterinary affairs for more than half a century and founder and first dean of the School of Veterinary Medicine at George Washington University. Drs. Wight, MacKellar, Schoening, and Crawford were formerly with the U. S. Department of Agriculture but are now retired and living in the Washington area.

S/CHARLES G. DURBIN, *Secretary.*

Florida

Dr. Sanders Returns from Costa Rica Assignment.—Dr. D. A. Sanders, Sr., head, Department of Veterinary Science, College of Agriculture and Agricultural Experiment Station of the University of Florida, has recently returned from a three-month assignment to Costa Rica where he served under provisions of a joint contract between the Foreign Operation Administration, the Costa Rican Ministry of Agricultural, and the University of

Florida, for mutual cooperative assistance in livestock and poultry disease and parasite research with the Costa Rican Agricultural Experiment Station.

Georgia

Changes in Personnel at Veterinary College.

—The School of Veterinary Medicine, University of Georgia, announces the following recent changes in faculty personnel: A. M. Mills (COR '20), promoted to head of the Division of Large Animal Medicine and Surgery; E. W. Causey (GA '52) promoted to head of the Division of Small Animal Medicine and Surgery; Helen Jordan (GA '55), to replace R. E. Bradley (GA '54) as instructor in pathology and parasitology; and M. L. Fleming (GA '55), to replace G. W. Patterson (API '51) who left to work toward an M.D. degree.

Hawaii

Territorial Association.—The Hawaii Territorial Veterinary Medical Association held its annual meeting Sept. 17, 1955, at the Board of Agriculture Building in Honolulu.

The program was presented by **Drs. E. H. Willers**, Honolulu; **J. M. Hendershot**, Wailuku, Maui; **Major Frederick W. Clayton**, Honolulu; **Mr. Larry Welch**, Los Angeles, Calif.; and **Mr. Harold Deakin**, Pitman-Moore Co.; with **Dr. Wilson Pang** presiding.

The newly elected officers are: **Drs. John**



Annual Meeting of the Hawaii Territorial Veterinary Medical Association

First row (front, left to right)—Drs. George H. Murphy, John M. Hendershot, Paul T. Nomura, Charles B. Webster, Doris Carlon, Nam Young Chung, Wilson M. Pang, Clarence Ching, Rodolfo T. Santeco.

Second row—Mr. Harold Deakin, Mr. Larry Welch, Drs. Robert F. Cross, Roy R. Harada, Major Frederick C. Clayton, U.S.A.F., Dr. William F. Parker, Capt. Alan B. Stevens, and Lt. Col. Lloyd V. Fry.

Third row—Lt. Col. William Dieterich, Dr. Joseph M. Sample, and Capt. Milton A. Beerwinkle.

M. Gooch, Kaneohe, president; Leslie A. Weight, Hilo, vice-president; and Robert F. Cross, Honolulu, secretary-treasurer.

The formal meeting was adjourned for a cocktail hour and Chinese dinner at the South Seas.

S/WILSON M. PANG, *Resident Secretary.*

Illinois

Northern Illinois V.M.A. Elects New Officers.—At its annual meeting in Rockford on Sept. 21, 1955, the Northern Illinois Veterinary Medical Association elected Dr. J. W. Boller, Harvard, as president for the ensuing year; Dr. E. C. Hannan, Maple Park, president-elect; Dr. John M. Nelson, DeKalb, secretary-treasurer; and Dr. James G. Hardenbergh, Rockton, member of the executive board.

Conference for Veterinarians.—The thirty-sixth annual Illinois conference and extension short course for veterinarians was held Oct. 13-14, 1955, at the College of Veterinary Medicine, University of Illinois, Urbana.

The conference speakers and their subjects were: **Drs. Gabel Conner**, Michigan State College, East Lansing (teat surgery and correction of prolapsed vagina); **A. L. Neumann**, University of Illinois (diethylstilbestrol in fattening rations of ruminants); **A. G. Schiller**, University of Illinois (clinical cases in small animals); **A. K. Merriman** and **N. H. Howlett**, Springfield (disease control activities in Illinois); **A. C. Todd**, University of Wisconsin, Madison (parasites of cattle); **P. D. Beamer**, University of Illinois (disease problems observed by diagnostic service); **A. G. Misener**, Chicago (dispensing without diagnosing); **F. A. Todd**, ARS, U.S.D.A., Washington, D. C. (exotic diseases); **J. O. Alberts**, University of Illinois (respiratory diseases of poultry); **R. P. Link**, faculty (atabrine as a taeniocide); **H. S. Bryan**, University of Illinois (antibiotic therapy in leptospirosis); **G. L. Ott**, Grafton, Wis. (distemper and hepatitis immunization); **H. E. Kingman**, assistant executive secretary of the AVMA, Chicago (AVMA activities).

The television demonstrations, by University of Illinois faculty members except where noted, included the following: necropsy technique for swine, **P. D. Beamer**; necropsy technique for poultry, **L. E. Hanson**; dental examination of cattle, **R. D. Hatch**; collection of preputial samples from bulls, **B. O. Brodie**; electroejaculation, and porcine cesarean section, **H. J. Hardenbrook**; and declawing cats, **A. G. Misener**, Chicago.

S/ROBERT GRAHAM, *Dean.*

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Veterinary Symposium.—The fifth veterinary symposium on the newer knowledge about dogs, sponsored by the Gaines Dog Research Center, was held Oct. 19, 1955, at the Kankakee Valley Golf Club in Kankakee. The pro-

gram follows: **Drs. Robert Graham**, dean, University of Illinois College of Veterinary Medicine, chairman; **George W. Mather**, University of Minnesota (geriatrics in canine practice); **H. Grady Young**, Thomasville, Ga. (cause, treatment, and prevention of heartworm); **James B. Allison**, Rutgers University, New Brunswick, N. J. (proteins in health and sickness); **K. M. Lee**, Veterinary Virus Research Institute, Cornell University, Ithaca (tissue culture and animal viruses); **W. W. Armistead**, dean, School of Veterinary Medicine, A. & M. College of Texas, College Station (buried skin autografts in dogs); **Carl F. Schlotthauer**, Mayo Foundation and School of Veterinary Medicine, University of Minnesota (tumors and cancers in dogs); **Hadley C. Stephenson**, Gaines Dog Research Center (discussion and answer period).

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Mississippi Valley Association.—The fifty-first annual convention of the Mississippi Veterinary Medical Association was held Oct. 26-27, 1955, at the Hotel Pere Marquette in Peoria.

The program consisted of the following speakers and their papers: **Drs. John R. Dick**, Fort Dodge Laboratories, Fort Dodge, Iowa (swine diseases); **Roger A. Grant**, Wyoming, Ill. (diseases of feeder lambs); **A. K. Merriam**, Division of Livestock Industry, Springfield (new regulations); **C. Boughton**, W. I. DuPont Co., Wilmington, Del. (parasitology in livestock production); **Victor M. Gellen**, Corn States Laboratory, Omaha, Neb. (swine erysipelas); **R. A. Gathmann**, Franklin, Tenn. (fluorosis of cattle, and rabies in Tennessee); **Joe F. Knappenberger**, Ashe Lockhart, Inc., Kansas City, Mo. (beef cattle production); **A. G. Misener**, Chicago (small animal practice); and **H. J. Hardenbrook**, University of Illinois, Urbana (dairy cattle surgery and sterility).

S/WILLIAM L. BEER, *Secretary.*

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Changes in Personnel at Veterinary College.

—The University of Illinois, College of Veterinary Medicine, announces the following new instructors on the staff: **R. E. Bradley** (GA '54), veterinary pathology and hygiene; **J. E. Fitzgerald**, Lloyd Helper, F. Ziegler, and T. N. Philips (all ILL '55), clinical medicine; and **N. D. Jones** (ILL '55), anatomy and histology.

Indiana

Short Course for Veterinarians.—The forty-third annual Indiana short course for veterinarians was held Oct. 5-7, 1955, at Purdue University, Lafayette. The speakers and their subjects were: **Drs. D. P. Gustafson**, Purdue University (hog cholera); **E. V. Morse**, Michigan State University, East Lansing (*Vibrio fetus* in bovine infertility); **R. D. Turk**, A.

& M. College of Texas, College Station (parasite problems); **J. W. Green**, state veterinarian, and **L. R. Barnes**, U. S. Department of Agriculture, Indianapolis (report of Livestock Sanitary Board and Animal Disease Eradication Branch, U.S.D.A.); **L. E. Boley**, University of Illinois, Urbana (hormones in reproductive disorders); **R. E. Allison**, Decatur, **J. H. Gregg**, Nappanee, and **M. S. Sheehy**, Washington, Ind. (poultry practitioners forum); **A. L. Delez**, Purdue University (scrapie); **H. L. Hurst** and **L. P. Doyle**, Purdue University (enteritis in swine); **J. F. Bullard**, Purdue University (clinical reports); **G. J. Christie**, State Livestock Sanitary Board, Indianapolis, and **H. E. Moses**, Purdue University (infectious bronchitis in chickens); **W. R. Pritchard**, Purdue University (hemorrhagic diseases); **R. G. Carlson**, Purdue University (transmissible erosive gastroenteritis and related diseases of cattle in Indiana); **M. W. Allam**, dean, School of Veterinary Medicine, University of Pennsylvania, Philadelphia (clinical veterinary medicine); **C. D. Van Houweling**, ARS, U.S.D.A. (animal disease eradication program); **H. L. Marsh**, Princeton, Ill. (general practice); **P. C. Bennett**, Iowa State College, Ames (differential diagnosis of swine diseases).

The program for the third day of the session consisted of various demonstrations by faculty members.

Dr. Floyd Cross, president of the AVMA and dean of the School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, was the speaker at the banquet.

s/J. L. KIXMILLER, Resident Secretary.

Wabash Valley Association.—On September 21, members of the Wabash Valley Veterinary Medical Association met in the Sheller Hotel in North Manchester to hear **Dr. Roy Westcott**, South Bend, discuss cattle diseases. The program was in charge of Dr. and Mrs. H. A. Stevens, North Manchester.

s/RONALD MATCHETTE, Secretary.

Northwestern Association.—**Dr. James W. Newberne** of Pitman-Moore Co., Zionsville, spoke on leptospirosis and other diseases in which a laboratory diagnosis may be important at the September 22 meeting of the Northwestern Indiana Veterinary Medical Association in Remington. The hosts were Dr. and Mrs. Leo Andres and Dr. and Mrs. James R. Taylor.

The women were entertained at the home of Dr. and Mrs. Andres by slides taken by Dr. and Mrs. McPhail on their recent trip to England and Scotland.

s/J. L. KIXMILLER, Resident Secretary.

Dr. and Mrs. Axby Celebrate Golden Anniversary.—More than a hundred friends joined in good wishes to Dr. and Mrs. J. L. Axby

at their home in Indianapolis on Sunday, Sept. 25, 1955, on the occasion of the couple's fiftieth wedding anniversary. Many messages and floral tributes were received from their host of friends.

Both Dr. and Mrs. Axby were natives of Lawrenceburg and have lived in Indianapolis for the past 23 years. Dr. Axby, a graduate of Chicago Veterinary College in 1903, was active in both civic and professional affairs, having served as mayor of Lawrenceburg from 1910 to 1914; in the Indiana legislature from 1917 to 1919; and as state veterinarian from 1933 to 1945. He joined the AVMA in 1908, was elected chairman of the second House of Representatives session at the Oklahoma City meeting in 1935, and served on the Executive Board from 1940 to 1948 from District III (Indiana, Illinois, Wisconsin). In recent years, he has been engaged in private practice in Indianapolis.

Iowa

Eastern Association.—The Eastern Iowa Veterinary Medical Association held its forty-second annual meeting in Cedar Rapids, Oct. 13-14, 1955, with Dr. W. E. Bowstead of Lowden presiding and 233 veterinarians registered.

The following scientific program was presented: **Drs. Gail E. Hawley**, Pfizer and Co., Inc., Terre Haute, Ind. (diseases of feedlot cattle; discussion by **Tom T. Bowstead**, DeWitt); **C. W. Brown**, ARS, U.S.D.A., Des Moines (livestock regulatory programs); **R. L. Dryer**, Iowa City (Boxer pups affected with congenital encephalitis to aid research in human medicine); **Arthur A. Case**, University of Missouri, Columbia (poisonous plants and other toxicology in animals; discussion by **V. Gellen**, Corn States Laboratories, Omaha, Neb.); **Loren D. Kintner**, University of Missouri, Columbia (interesting cases; discussion by **A. J. Cotten**, Grundy Center); **B. W. Kingrey**, Iowa State College, Ames (traumatic gastritis; discussion by **Birk C. Lowther**, Hopkinton); **Sam Elmer**, Richland Center, Wis. (bovine surgery; discussion by **Oliver W. Whitcomb**, Center Point); **Maynard L. Spear**, Iowa State College, Ames (life cycle, swine housing and equipment; discussion by **R. E. Elson**, Vinton); **M. J. Brinegar**, Allied Mills, Libertyville, Ill. (swine nutrition; discussion by **Emil L. Koch**, Plainfield). **Dr. Maurice C. Larson**, Keystone, led the question box period which concluded the program.

At the annual banquet, honorary memberships were conferred upon Dr. L. A. Merillat (ONT '88), of Chicago, and Dr. Frank M. Wilson (CVC '11), Mechanicsville, for their long and outstanding service to the profession.

The following officers were elected: **Drs. W. H. Thompson**, Earlville, president; **R.**

Rasmussen, Bloomfield, vice-president; F. E. Brutsman, Traer, secretary; W. M. Lynch, Cedar Rapids, treasurer; and John Carey, West Liberty, to the board of trustees.

S/F. E. BRUTSMAN, *Secretary*.

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East Central Society.—The East Central Iowa Veterinary Medical Society met at the Hotel Roosevelt in Cedar Rapids on November 10. The guest speaker, Dr. L. Proctor of Oelwein, discussed changes in dairy cattle practice.

The new officers of this Society are Drs. Earl L. Wahl, Anamosa, president; Edward W. Speer, Stanwood, vice-president; and Guy S. Jones, Cedar Rapids, secretary-treasurer.

S/GUY S. JONES, *Secretary*.

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Changes in Personnel at Veterinary College.

—The Division of Veterinary Medicine, Iowa State College, announces the following recent faculty appointments: B. W. Kingrey (ISC '44), as head of the Department of Medicine and Surgery, replacing G. R. Fowler (WSC '25) who remains as professor of surgery; J. E. Lovell (ISC '46), transferred from anatomy to obstetrics and radiology; J. M. Brewer (UP '55), to the veterinary diagnostic laboratory. McGehee (ISC '55) and F. F. Johnson (MIN (MINN '55), to the veterinary diagnostic laboratory.

Dr. Lloyd D. Jones (ISC '31) resigned to join the diagnostic staff of Corn States Laboratories, Inc., at Omaha, Neb.

Kansas

Changes in Personnel at Veterinary School.

—Kansas State College announces the following veterinarians appointed to the faculty of the School of Veterinary Medicine: Department of Pathology—Donald F. Johnson, Jr. (TEX '44), associate professor; Wayne W. Kirkham (TEX '44), assistant professor; and Harry D. Anthony (KSC '52), instructor. Department of Surgery and Medicine—George W. Eberhart (KSC '41) and Jean C. Smith (KSC '45), as assistant professors.

Resignations include: Department of Surgery and Medicine—James H. Cowan (UP '48), Howard E. Gill (KSC '52), and Richard A. Spring (MSC '52); Department of Anatomy—Lawrence E. Evans (KSC '51).

Kentucky

In Memory of Dr. Dimock.—On Nov. 10, 1955, exercises were held at the University of Kentucky during which a portrait of the late Dr. W. W. Dimock, for many years head of the Department of Animal Pathology, was unveiled at the Animal Pathology Building. The portrait was given to the Department by a group of Dr. Dimock's friends.

At the same time, a bronze tablet dedi-

cating the building to the memory of Dr. Dimock was presented and the name of the building was officially changed to W. W. Dimock Animal Pathology Building. Many friends and former associates of Dr. Dimock were present to honor a man who long served the University with high distinction.

Maine

Dr. Fredrickson Receives Poultry Fellowship.

—Dr. T. Norman Fredrickson (ONT '55), Scarborough, Ont., who received the Fort Halifax Poultry Disease Fellowship, has begun work at the University of Maine. His thesis work for the M.Sc. degree will be done in the Department of Animal Pathology and will involve avian hematology in health and disease. The course work will be concentrated in the Department of Zoology with supporting subjects in bacteriology, biochemistry, and statistics.

S/H. L. CHUTE, *Resident Secretary*.

Maryland

Death of Dr. Hulbert Young.

—Hulbert Young (UP '00), 77, Owings Mills, Md., died on Sept. 19, 1955, following a prolonged illness due to lymphosarcoma. Born in Washington, D. C., the son of Nicholas E. Young, first president of the National Baseball League, Dr. Young came to Baltimore shortly after graduation to manage a certified milk laboratory and continued in that work for many years. For 13 years prior to his illness, he was veterinarian for the state racing commission. He served for 36 years as secretary of the state veterinary examining board and was one of the founders of the Maryland State Veterinary Medical Association. He joined the AVMA in 1912. For a period, Dr. Young was on the veterinary faculty at George Washington University and was made dean in 1914.

Surviving are his widow, Mrs. Gertrude Young; two sons, a daughter, two brothers, a sister, a stepdaughter, and seven grandchildren.

Services were held at St. John's Episcopal Church, Mount Washington, where he was a vestryman. Interment was in Druid Ridge cemetery.

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Colonel Lasher and Dr. Mingle Attend British Meeting.

—Colonel Norbert A. Lasher, V.C., (U.S.A.F.), and Dr. C. K. Mingle of the ARS, U.S.D.A., were official representatives of the United States at the 73rd annual congress of the British Veterinary Association held in Belfast, Ireland, Sept. 4-6, 1955.

Massachusetts

Worcester County Association.

—The Worcester County Veterinary Medical Association met at the Hotel Bancroft in Worcester on November 2. Dr. Todd Munson, of the Angell

Memorial Animal Hospital, Boston, discussed interesting and unusual veterinary cases. During the business session, reports were made by the committees on: ear cropping, telephone directory advertising, and on the progress of the dog breeders' directory.

S/DONALD W. HEY, *Secretary*.

Minnesota

Changes in Personnel at Veterinary School.—Recent appointments to the faculty of the School of Veterinary Medicine, University of Minnesota, include: Henry J. Griffiths (ISC '43), assistant director of the School of Veterinary Medicine; Harvey H. Hoyt (ISC '42), head of the Division of Veterinary Medicine and Clinics; Jack T. Tumlin (GA '53), instructor in veterinary bacteriology and public health; Donald A. Willigan (ONT '52), instructor in veterinary pathology and parasitology; William M. Dickson (COL '39), instructor in veterinary physiology; Keith I. Loken (MIN '53), research fellow to work on mastitis; Donald M. Barnes (MIN '55), assistant in diagnostic laboratory; Orin H. Osborn (MIN '55), research fellow on air sac infection of poultry; and Victor Perman (MIN '55), appointed research fellow on soybean oilmeal toxicity.

The following have resigned from the faculty: Dr. William F. Cates (MIN '54) of the Division of Veterinary Medicine and Clinics, to engage in private practice in Emery, S. Dak.; and Carl E. Rehfeld (KSC '47) of the Division of Veterinary Pathology and Parasitology, to accept a position as head of the Veterinary Division, Radiobiology Laboratory, School of Medicine, University of Utah, Salt Lake City.

Missouri

Short Course.—Missouri's thirty-first annual short course for graduate veterinarians was held Oct. 3-4, 1955, under the direction of the School of Veterinary Medicine, University of Missouri, in cooperation with the Missouri Veterinary Medical Association at the University in Columbia.

The following scientific program was presented: **Drs. Peter E. Madsen**, Sheridan, Wyo. (beef cattle practice); **Lester Proctor**, Oelwein, Iowa (disease problems of swine); **L. N. Atkinson**, Kirkwood (infectious diseases of small animals); **M. J. Twiehaus**, Kansas State College, Manhattan (autopsy hints); **L. A. Rosner**, state veterinarian, Jefferson City (new brucellosis law); **W. E. Boucher**, Griswold, Iowa; **J. E. English**, Columbia; **F. D. Gentry**, Springfield; **L. L. Rice**, Shelbyville; **W. A. Sheets**, Farmington; **J. A. Zacher**, Kansas City (practitioners' seminar).

The following participated in television demonstrations: **Drs. E. F. Ebert**, moderator; **W. R. Sheets**, Farmington; **E. E. Burgess**, Jef-

erson City; **P. F. Jungerman**, Aurora; **W. O. Kelley**, Independence; **C. M. Cooper**, Kansas City; **Max Sutter**, Kansas City; **W. J. Gough**, Kansas City; **K. Maynard Curtis**, Kansas City; **D. O. Wendt**, Bonner Springs, Kan.; **D. D. Mottesheard**, Marshfield; **J. M. Haggard**, Delphi, Ind.; **H. W. Howell**, Columbia; **D. E. Rodabaugh**, Columbia; **J. M. Wingate**, Jefferson City; **J. T. McGinity**, J. E. English, and **C. J. Bierschwal, Jr.**, Columbia.

Registration reached an all-time high of slightly over 275, with Iowa, Illinois, Arkansas, Kansas, Nebraska, and Tennessee represented.

On Sunday night preceding the conference, the alumni of the University of Missouri School of Veterinary Medicine held their annual banquet and business meeting. Of the 169 living graduates of the school, 104 were present for either the banquet or one or both days of the conference.

S/A. H. GROTH, *Resident Secretary*.

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Southeastern Association.—The Southeastern Missouri Veterinary Medical Association met in Sikeston on September 21. The speakers were **Drs. L. D. Kintner** and **C. J. Bierschwal**, School of Veterinary Medicine, University of Missouri, Columbia; **A. R. Bott**, Corn Belt Laboratories, East St. Louis, Ill.; **L. A. Rosner**, state veterinarian, Jefferson City; and **E. G. Bailey, Jr.**, Dexter.

About 35 veterinarians attended this meeting. A clinic was held in the afternoon at the Sikeston veterinary hospital. The catfish dinner for which this meeting is famous was served at noon.

S/A. H. GROTH, *Resident Secretary*.

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Greater St. Louis Association.—The October 7 meeting of the Greater St. Louis Veterinary Medical Association was held in the Sheraton Hotel. The guest speaker was **Mr. L. L. Fortner** of the National Cylinder Gas Co., who demonstrated oxygen equipment. **Drs. L. N. Atkinson** and **T. T. Shore** assisted in the demonstration.

S/ALLEN B. SHOPMAKER, *Secretary*.

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Kansas City Association.—The Kansas City Veterinary Medical Association met at the Exchange Hall on October 18 to hear **Dr. Raymond L. Butler** of Topeka, Kan., present practice tips. He also demonstrated various diagnostic techniques.

S/BUSCH MEREDITH, *Secretary*.

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Changes in Personnel at Veterinary College.—The School of Veterinary Medicine at the University of Missouri announces the appointment of **K. H. Niemeyer** (MO '55) as instructor in medicine and surgery to replace **W. P. Blake** (COL '41) who has gone into practice in Phoenix, Ariz.

New Brunswick

Provincial Association.—The annual meeting of the New Brunswick Veterinary Association was held in Moncton on October 15. Twenty-two veterinarians were in attendance. In the absence of the president, Dr. Donald Steeves, the vice-president of the Association, conducted the meeting. Three papers were presented. **Dr. G. C. Fisher**, Charlottetown, P.E.I., spoke on the highlights of the recent Canadian Veterinary Medical Association meeting held in Saskatoon. **Dr. S. E. Magwood**, Sussex, spoke on cattle practice, and **Dr. C. S. Rammage**, Fredericton, described how co-ordinating field work with laboratory services helped his practice.

At a business session held later in the day, the following officers were elected for the coming year: Drs. Donald Steeves, Moncton, president; L. J. Dolan, Port Elgin, vice-president; H. E. Knapp, Moncton, secretary-treasurer; and as councillors, Drs. W. M. Mutrie, Woodstock; C. S. Rammage, Fredericton; and F. MacLeod, Saint John.

The business session was followed by a dinner and social evening which was enjoyed by all.

S/J. F. FRANK, *Resident Secretary*.

New York

Death of Dr. Udall.—Dr. Denny H. Udall, 81, professor emeritus of veterinary medicine at Cornell University and a pioneer in the diagnosis, control, and treatment of bovine mastitis, died on Sept. 9, 1955.

Dr. Udall had remained active since his retirement in 1942 after 34 years on the faculty of New York State Veterinary College and had been at his office there the day before his death.

Born in Vermont in 1874, he received the B.S.A. degree at the state university in 1898 and his D.V.M. degree from Cornell in 1901. In 1938, the University of Vermont conferred on him the honorary D.Sc. degree. Following graduation, he practiced for a time in Vermont and then was associate professor of surgery at Ohio State University from 1903 to 1908. In the latter year, he was made professor and head of the Department of Veterinary Medicine at Cornell.

"Denny" Udall served his profession and his country in many ways. A well-known and highly respected teacher, he insisted on accuracy, always worked for the best interests of the private practitioner, and was held in high esteem everywhere. Author of "The Practice of Veterinary Medicine," "Handbook of Materia Medica and Therapeutics," and other textbooks, and translator of Frohner's "General Surgery," Dr. Udall also contributed many articles to veterinary literature and was a fre-

quent participant in veterinary association programs.

He served in two wars, having been a private in the Spanish American War and a major in the Veterinary Corps in World War I, serving as veterinarian of the 86th Division and commander of veterinary hospitals 7 and 18 in France.

Among other honors, Dr. Udall received was selection as first recipient for the Twelfth International Veterinary Congress Prize from the AVMA in 1937 for his distinguished contributions to veterinary medicine. He was a past-president of the New York State Veterinary Medical Society and was an active member of several other professional associations, including the AVMA which he joined in 1913. He was also a member of Sigma Nu, Phi Zeta, Alpha Psi, and Phi Kappa Phi fraternities and Sigma Xi honorary society.

He is survived by his widow, three children, and two grandchildren. One son, Dr. Robert H. Udall (COR '41), is on the faculty of the School of Veterinary Medicine at Colorado A. & M. College, Fort Collins.

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New York City Association.—At the regular meeting of the Veterinary Medical Association of New York City, Inc., held Nov. 2, 1955, at the New York Academy of Sciences, **Dr. Robert B. McClelland**, Buffalo, discussed the rationale of x-ray therapy.

S/C. E. DICAMP, *Secretary*.

Ohio

Changes in Personnel at Veterinary College.—Major faculty changes at the College of Veterinary Medicine, Ohio State University, beginning the 1955 fall term include: R. E. Rebrassier (OSU '14), new position of assistant dean; Bruce H. Edgington (OSU '12), professor emeritus of veterinary research; Fleetwood R. Koutz (WSC '36), chairman, Department of Veterinary Parasitology, succeeding Dr. R. E. Rebrassier; Charles R. Smith (OSU '44), chairman, Department of Veterinary Physiology and Pharmacology; Martin Y. Andres (OKL '51), instructor in veterinary anatomy; James L. Gabel (OSU '55), instructor in veterinary medicine; Glyde A. Marsh (OSU '52), instructor in veterinary pathology, in charge of poultry diseases; Thomas E. Murchison (TEX '55), instructor in veterinary pathology; Svend W. Nielsen (RVC, Denmark, '51), instructor in veterinary pathology; Thomas E. Powers (OSU '53) and Richard S. Ray (OSU '55), instructors in veterinary physiology and pharmacology, John H. Simpson (OSU '55), instructor in veterinary surgery; and Robert G. Whiteus (OSU '52), returned from military leave as instructor in veterinary medicine.

The following have resigned: Harry M. Mauger (OSU '39), assistant professor of veterinary anatomy, to enter private practice; Fred J. Kingma (OSU '38), professor of veterinary physiology and pharmacology, to become associated with Abbott Laboratories; and John C. Range (OSU '42), instructor in veterinary medicine, to engage in farming.

Military leave has been granted to: Richard A. Griesemer (OSU '53), instructor in veterinary pathology; and William J. Roenigk (OSU '54) and Albert A. Gabel (OSU '54), instructors in veterinary medicine.

Ontario

Changes in Personnel at Veterinary College.

—The Ontario Veterinary College, University of Toronto, announces the following new appointments: H. M. Philips (EDN '50), to medicine and surgery; T. D. Ford (ONT '55), to pathology; T. R. B. Barr (EDN '55), to bacteriology; J. R. Clarke (ONT '55) and R. A. Beardall (ONT '55), to small animal medicine and surgery; and D. M. Elliot (ONT '55), to the farm service division of medicine and surgery.

Pennsylvania

State Association.—The seventy-third annual convention of the Pennsylvania State Veterinary Medical Association was held at the Penn Harris Hotel in Harrisburg on Oct. 12-14, 1955.

The following speakers presented papers during the scientific session: **Drs. William R. Korns**, Somerset (milk fever); **Howard A. Milo**, Harrisburg (illustrated review of BAI's divisions); **William F. Hoffman**, Pittsburgh (practical small animal surgery); **J. P. Hokanson**, Pennsylvania State University, State College (common cattle diseases); **Charles W. Raker**, University of Pennsylvania, Philadelphia (surgical treatment of joint and bone diseases in animals); **Arthur V. Bartselager**, Stewartstown (bovine infertility); **Berwyn F. Mattison** (M.D.), secretary of health, Commonwealth of Pennsylvania (role of the veterinarian in public health); **Wilson L. Miller**, Rohrerstown (poultry practice); **Robert B. McClelland**, Buffalo (radiation therapy); **R. F. Baker**, Spencerville, Ohio (mucosal disease syndrome in cattle); **Earl N. Moore**, Wooster, Ohio (turkey diseases); **Brig. Gen. James A. McCallam**, Washington, D. C. (social security and the veterinary profession); **Vincent W. Ruth**, Lansdale, and **H. S. Forney**, Palmyra (practitioners' viewpoint on social security).

S/RAYMOND C. SNYDER, Secretary.

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Changes in Personnel at Veterinary School.

—The School of Veterinary Medicine, University of Pennsylvania, announced that during the past year the following veterinarians have been

added to the faculty: **George Elliott** (GA '53), instructor in veterinary pathology; **Harker Rhodes** (UP '55), instructor in veterinary surgery; **Raymond Schlosser** (UP '52), instructor in veterinary surgery; **Peter Craig** (UP '55), instructor in veterinary pathology; and **Clarence Woodhouse** (OSU '35), E. I. Du Pont de Nemours and Co., visiting associate in veterinary medicine.

The following persons have left the faculty during the past year: **Dr. Frank Fielder** (COL '50), assistant professor in radiology, to join the staff of Schering Corp.; and **Dr. Louise Lombard** (KSC '44), assistant professor of veterinary pathology, to U.S.P.H.S., Bethesda, Md.

Texas

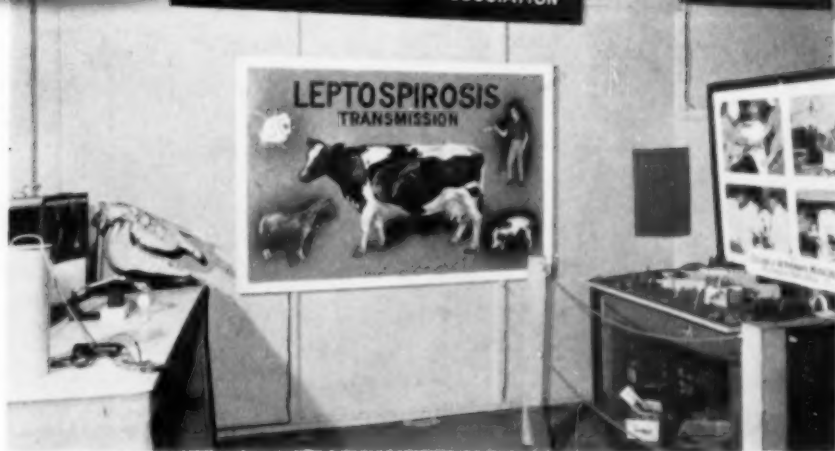
Changes in Personnel at Veterinary School.

—The School of Veterinary Medicine, Texas A. & M. College, announces the following recent additions to the faculty: **L. C. Grumbles** (TEX '45) has returned, after two years of service in the Veterinary Corps, to his position as associate professor of veterinary bacteriology and hygiene; **C. H. Bridges** (TEX '45), associate professor of veterinary pathology; **Patrick L. Hubert** (TEX '52), instructor in large animal medicine and surgery; **E. M. Jordan** (API '43), instructor on the small animal clinic staff; **S. M. Gaafar** (TEX '55), instructor in veterinary parasitology; and **A. L. Flowers** (TEX '50), research staff in bacteriology and hygiene.

Washington

State Association.—The annual meeting of the Washington State Veterinary Medical Association was held at the Leopold Hotel, Bellingham, on September 23-24, with a record attendance. It was sponsored by the Tri-County V.M.A., with **Dr. R. E. Ebricht** as general chairman, **Dr. Primo Piovesan**, assistant general chairman, **Dr. Glenn Pettit**, program chairman.

Appearing on the excellent program were **Dr. Jack Dunlap**, Pullman (internal parasites of farm animals); **Mr. Stewart Bledsoe**, Ellensburg (farmer-veterinarian relationship); **Drs. Winston Malmquist**, Cutter Laboratories, Berkeley, Calif. (mare pregnancy test); **R. L. Ott**, Pullman (differential diagnosis of hepatitis, distemper, and leptospirosis); **E. Stone**, dean, College of Veterinary Medicine, State College of Washington, Pullman (what's new at the College); **C. A. Manthei**, Beltsville, Md. (seroagglutination reactions of calf-vaccinated and nonvaccinated cattle); **F. W. B. Smith**, Vancouver, B. C. (Canadian foot-and-mouth disease film); **F. M. Shigley** and **A. E. Crouse**, Olympia (report on brucellosis); **George Muller**, Renton (firing a horse); **Bill Kuhl**, Baker, Ore. (spaying a heifer); **Carl Schneider**, Kirk-



The exhibit planned by the Washington State and South Puget Sound Veterinary Medical Associations and the Washington State College Student Chapter of the AVMA which was shown at the Western Washington Fair in Puyallup on September 17-25.

land (standing castration); and **Max Nichols**, Redmond (shortwave therapy).

President Don Clarke presided at the well-attended and enthusiastic business session and announced a gain in membership of more than 100 during the past year. He praised the successful efforts of the various committees which helped in the growth of the Association.

The following officers were elected: Drs. R. T. Hostetler, Goldendale, president; Irwin Erickson, Puyallup, president-elect; B. D. Benedictson, Union Gap, treasurer; and B. R. Pinckney, Tacoma, secretary.

s/B. R. PINCKNEY, Secretary.

Changes in Personnel at Veterinary College.

—New veterinarians on the faculty of the College of Veterinary Medicine, State College of Washington, are: G. A. MacInnis (OSU '50), acting assistant professor, clinical medicine and surgery, filling the position of R. E. Watts (COL '42) who is in Pakistan; H. C. Butler (WSC '54), instructor, clinical medicine and surgery, to replace J. D. Robinette (WSC '54) who entered private practice in Boise, Idaho; June Iben (OKL '55), acting junior veterinarian, Department of Veterinary Microbiology; J. L. Palotay (KSC '50), acting instructor, veterinary pathology, filling the position of R. W. Leader (WSC '52) who is on leave doing graduate work at the University of California at Berkeley; D. C. Brinkman (WSC '51), acting instructor of physiology and pharmacology, replacing William Dickson (COL '49) who is on leave doing graduate work at the University of Minnesota; and R. K. Farrell (WSC '55), acting junior veterinarian, veterinary science, on a temporary research project, working on bluetongue.

West Virginia

State Association.—The 1955 fall meeting of the West Virginia Veterinary Medical Association was held October 9-10 in the West Virginian Hotel in Bluefield.

The following speakers and their subjects comprised the program: **Drs. W. G. Hoag** and **James R. Rooney, II**, Virginia Polytechnic Institute, Blacksburg (mucosal disease in cattle); **A. H. Craig, Jr.**, Pitman-Moore Co., Indianapolis, Ind. (new concepts in veterinary medicine); **N. O. Olson**, West Virginia University, Morgantown (poultry problems); **Allen S. Barnes**, veterinarian in charge, **D. R. Bowers**, assistant veterinarian in charge, and **T. C. Green**, state veterinarian of West Virginia (brucellosis program); and **V. H. Miller**, Charleston (rabies).

The new officers of the Association are Drs. N. O. Olson, Morgantown, president; C. L. Heinrich, Clarksburg, president-elect; and D. A. Munro, Morgantown, secretary-treasurer.

s/D. A. MUNRO, Secretary

D. R. BOWERS, Resident Secretary

FOREIGN NEWS

Formosa

New Veterinary Hospital Named for Dr. Newsom.—Three years ago, Dr. I. E. Newsom, late dean of veterinary medicine and one-time president of Colorado A. & M. College, spent nearly a year in Formosa as consultant to the Sino-American Joint Commission for Rural Reconstruction (J.C.R.R.). While there, he taught pathology in the department of animal husbandry and veterinary medicine at the National Formosa University, and prepared a report on the veterinary education problem in Free China. His report emphasized the need for an independent department of veterinary medicine and a new veterinary hospital at the University.

The proposal was approved by the Chinese government and J.C.R.R., and a subsidy was provided for construction and partial equipment of the hospital. The outpatient clinic and wards were completed late in 1954 and the clinic has been open to the public since March.



The ninety-first class of veterinary officers completed (Oct. 28, 1955) the course at the Army Medical Service Meat and Dairy Hygiene School in Chicago. The class visited AVMA headquarters and heard talks on the work of the Association.

First row (front, left to right)—S.F.C. Frank J. Smith; Major Glenn A. Washburn, instructor; Major George T. Dalziel, instructor; Lt. Col. Wayne D. Shipley, director; Col. Philip R. Carter, commandant; Major Dan Hightower, instructor; Major James B. Young, instructor; Major Roy W. Upham, instructor. Second row—First Lieutenants Melvin U. Pettit, Royce W. Smith (U.S.A.F.), Rollin W. Vickery, Capt. Enver Sansal (Turkish Army), First Lieutenants Roderick D. Zachary, Robert E. Cope, Navin H. McKay, Jr., John A. O'Connor.

Third row—First Lieutenants James R. Zosel, Alan J. Port, Meredith J. Wiltfong, Frederick G. Leininger, Robert H. Featherston, Ernest E. Hinson, Jr., Ivan R. Edwards, Athanasios Veltos (Greek National Army), Elihu B. Boroson, George M. Yarbrough (U.S.A.F.).

Fourth row—First Lieutenants Harvey L. Arand (U.S.A.F.), Alfred C. Clausen, Robert K. Gubser, Van D. Sandstedt, William B. Clark, Jr., Hiram H. Faubion, Harry E. Wendler, William A. Limberger, Jr., Clair E. Butler, Donald G. Beck, Martin D. Kvittle.

(FOREIGN NEWS—Continued from p. 553)

The main building comprises classrooms, library, laboratories, and offices for the faculty. The building will be completed in April, 1956, and will be named Newsom Hall in memory of the late dean.

s/S. S. YOUNG, *AVMA Correspondent*.

VETERINARY MILITARY SERVICE

Courses in Veterinary Radiological Health.

—The Oak Ridge Institute of Nuclear Studies, in cooperation with the University of Tennessee-Atomic Energy Commission Agricultural Research Program, has scheduled several



Members of the fifth class in veterinary radiological health at Oak Ridge Institute of Nuclear Studies were from both Army and the Air Force. The course is conducted by the institute in cooperation with the University of Tennessee-Atomic Energy Commission Agricultural Research Program.

First row (front, left to right)—Lt. Col. Claude O. Wilder, Waco, Texas; Lt. Col. Ralph D. Walters, Hempstead, N.Y.; Lt. Col. James P. Crawford, Fort Sam Houston, Texas; Col. Clarence L. Taylor, Chicago; Lt. Col. Bernard Trum, Oak Ridge Institute; Lt. Col. Burt W. English, San Antonio, Texas; Lt. Col. Thomas C. Jones, Washington, D.C.; and Lt. Col. Harold F. Beadner, Riverside, Calif.

Second row—Lt. Col. Irvin T. Reed, Ford Ord, Calif.; Major George O. Thomas, Shreveport, La.; Major James B. Young, Chicago; Major Samuel L. Kirk, Fort Sill, Okla.; Lt. Col. Walter T. Carll, Fort Knox, Ky.; Dr. John P. Manning, University of Illinois, College of Veterinary Medicine, Urbana; Major William E. Rothe, Washington, D.C.; and Lt. Col. G. M. Kerr, Fort Benning, Ga.

Third row—Major Max Nold, Oak Ridge Institute; Lt. Col. John P. Powell, West Point, N.Y.; Lt. Col. Edwin F. Beckom, Sumter, S.C.; Lt. Col. Daniel P. Sasmore, Washington, D.C.; Capt. Milford D. Harris, University of Texas, Austin; Lt. Col. Bjarne N. Folling, Fort Leonard Wood, Mo.; Major Howard B. Slider, Fort Meyer, Va.; and Major U.S. Grant Kuhn, III, Oak Ridge Institute.

two-week courses designed to provide indoctrination in health physics. It is specifically intended to instruct Armed Forces veterinary officers in the evaluation of problems of radiation phenomena, particularly in relation to their biological effects and the possible or potential factors involved in the radio-contamination of food-producing animals or animal food products. Courses subsequent to those already given are scheduled to open March 12, April 9, April 23, and May 7, 1956.

BIRTHS

Dr. (MSC '52) and Mrs. Robert L. Mowry, Sturgis, Mich., announce the birth of twin daughters, Terri Jo and Kerri Sue, on May 17, 1955.

Dr. (TEX '43) and Mrs. Edward G. Streetman, Nederland, Texas, announce the birth of their fourth son, Steve Arnold, on July 28, 1955.

Dr. (KSC '54) and Mrs. Joseph S. Wheatley, Chicago, Ill., announce the birth of a daughter, Pamela Jo, on July 28, 1955.

Dr. (API '54) and Mrs. J. E. Lee, Lawrenceburg, Tenn., announce the birth of a son, Michael Earl, on Aug. 11, 1955.

Dr. (COR '54) and Mrs. Henri C. Marsh, Carswell Air Force Base, Fort Worth, Texas, announce the birth of a son, Keith Arthur, on Aug. 13, 1955.

Dr. (ISC '43) and Mrs. R. C. Schuknecht, Saukville, Wis., announce the birth of a son, Thomas Roy, on Aug. 28, 1955.

Drs. Craig (PA '48) and Hortense F. (COR '53) Rowan, Weiser, Idaho, announce the birth of a son, Ronald Ford, on Sept. 13, 1955.

Dr. (MO '54) and Mrs. Bernard Baker, East Prairie, Mo., announce the birth of a son, Jeffery Lynn, on Sept. 14, 1955.

Dr. (ISC '52) and Mrs. L. S. Shirrell, Frankfort, Ky., announce the birth of twins, Judy Ann and Jack Neal, on Oct. 9, 1955.

DEATHS

Clyde M. Barnum (GR '14), 64, Kent City, Mich., died Aug. 3, 1955. Dr. Barnum had practiced in the Kent City area for 42 years. He is survived by his widow, two daughters, and a son.

Jonathan C. Bartholomew (UP '91), 93, Berwyn, Pa., died Oct. 15, 1955. Dr. Bartholomew had been retired for several years. He is survived by a son.

Edward V. Beaumont (KCV '11), 74, Kansas

City, Kan., died late in August, 1955. Dr. Beaumont was a meat inspector for 42 years prior to his retirement in 1950. He is survived by his widow and a daughter.

★Robert D. Boast (ONT '11), 68, Winnipeg, Man., died July 19, 1955. Dr. Boast was employed with the Health of Animals Division for 42 years prior to his retirement in January, 1955. He was a member of the Manitoba and Canadian Veterinary Medical Associations and of the AVMA. Dr. Boast is survived by his widow, two daughters, and five grandchildren.

John F. D. Bowersox (ONT '08), 69, Hanover, Pa., died July 11, 1955, in an automobile accident. Dr. Bowersox is survived by his widow and seven children.

★Edwin B. Campbell (ONT '52), 36, Komo, Ont., died Oct. 12, 1955, of acute leukemia. Dr. Campbell, a general practitioner, was a member of the Canadian Veterinary Medical Association, the AVMA, and the Delta Chapter OTS. He is survived by his widow, the former Maureen Chute.

John M. Condon (MCK '17), Delano, Calif., died April 16, 1955. Dr. Condon had practiced in Chicago for several years before going to California.

★Albert J. Crane (COR '37), 56, Glens Falls, N. Y., died Sept. 13, 1955. Dr. Crane had practiced in Plainfield, N. J., and Glen Cove, N. Y., before coming to Glens Falls. He was a member of the Hudson Valley and New York State Veterinary Medical Societies and of the AVMA. His widow survives.

LaRue E. Davis (IND '11), Wilbur, Ind., died July 18, 1955. Dr. Davis had practiced in the Plainfield, Ind., area for a number of years, but recently was associated with the G. D. Searle Pharmaceutical Co. in Chicago. He is survived by his widow and a son.

William H. Dean (MCK '18), 59, Carrier Mills, Ill., died July 19, 1955. Dr. Dean had been employed by the state for several years and had also served Carrier Mills as mayor, city clerk, and assessor. He is survived by his widow and a son.

Joseph H. Dennen (HAR '98), 83, Exeter, R. I., died about June 20, 1955. Dr. Dennen also had received an M.D. degree. He is survived by one son.

Herbert W. Elder (USC '11), 74, Manning, S. Car., died June 6, 1955. Dr. Elder was a general practitioner.

Oscar H. Eliason (ONT '01), 82, Madison, Wis., died April 21, 1955. Dr. Eliason had served the State of Wisconsin for more than 30 years, first as state veterinarian from 1912 until 1923, then in field work on the tuberculosis program, and later as state humane agent. He is survived by his widow.

Henry E. Ellis (ONT '14), Millbrook, Ont.,

died Aug. 14, 1955. Dr. Ellis was a general practitioner. He is survived by his widow.

★**Hugh Gaw** (MCG '03), 78, North Attleboro, Mass., died Oct. 13, 1955. Dr. Gaw was a general practitioner. He was admitted to the AVMA in 1929.

R. D. Gilbert (OSU '16), Gettysburg, Ohio, died (date not known). Dr. Gilbert was a general practitioner.

William J. Glasgow (ONT '94), 86, Springfield, Mass., died Aug. 4, 1955. Dr. Glasgow is survived by his widow, a daughter, and a granddaughter.

W. G. Hassell (KCV ??), 91, Grayville, Ill., died Aug. 8, 1955. Dr. Hassell had served two terms as mayor of Grayville and had practiced in the community until age forced his retirement. He is survived by three sons, two daughters, six grandchildren, and eight great grandchildren.

Charles F. Henry (KCV '15), 69, Westchester, Pa., died June 8, 1955. Dr. Henry had served in World War I. At the time of his death he was raising horses.

Allen F. Hill (MCK '07), 73, Littleton, N. H., died May 2, 1955. He had practiced in Littleton for nearly fifty years.

Fred A. Hines (KCV '13), 74, Creston, Iowa, died Aug. 7, 1955. Dr. Hines had practiced in Gravity, Iowa, for 28 years and had served as its mayor before he established his practice in Creston in 1941. His widow survives.

Alexander Hughes (ONT '13), 80, Orangeville, Ont., died Aug. 5, 1955. Dr. Hughes had practiced in Grand Valley for many years before he retired and moved to Orangeville. He is survived by two sons and two daughters.

★**George D. Jelen** (OSU '23), 57, Marysville, Ohio, died Sept. 20, 1955. Prior to his retirement in February, 1954, Dr. Jelen had served as BAI inspector in charge at Pittsburgh, Pa., for a number of years. He was a member of the National Association of Federal Veterinarians, the Ohio Veterinary Medical Association, and of the AVMA.

Fred B. Jones (CVC '15), 76, East Moline, Ill., died in August, 1955. Prior to his retirement, Dr. Jones had practiced in Dixon and Mendota, Ill.

John Laughlin (COR '20), 61, Lockport, N. Y., died Aug. 17, 1955. Dr. Laughlin was a general practitioner. He is survived by his widow, two daughters, and a son.

John F. McCabe (STJ '20), Williamsburg, Iowa, died recently. Dr. McCabe, a general practitioner, had been a member of the AVMA.

R. Jay MacDonald (ONT '07), Jamaica, N. Y., died July 17, 1955. Dr. MacDonald was a general practitioner.

Earl T. Martin (KCV '14), Las Vegas, Nev., died Sept. 13, 1955, after a lengthy illness. Dr. Martin was a general practitioner.

Fred Morphy (ONT '05), Toronto, Ont., died June 27, 1955.

George E. Norman (IND '14), 69, Jasper, Ind., died July 28, 1955. Dr. Norman had practiced in Jasper since receiving his D.V.M. degree except for a few years when he served as postmaster. He had been a member of the AVMA.

Harold D. O'Brien (KSC '11), 66, Russell, Kan., died Aug. 11, 1955. Dr. O'Brien had practiced in Russell since 1929, and had served the city as mayor from 1943 to 1945. He is survived by his widow, three children, and seven grandchildren.

Warner Overfield (TH '18), 73, Hillsboro, Ind., died Sept. 30, 1955. Dr. Overfield, since his retirement eight years ago, had engaged in farming. He is survived by his widow, three daughters, and a grandson.

Ernest C. Riddell (KCV '09), Drew, Miss., died recently (date not known). Dr. Riddell was a general practitioner.

L. W. Russell (CVC '16), Anamosa, Iowa, died May 6, 1955. Dr. Russell had been in ill health for two years.

Claude C. Schafer (ONT '08), 73, Mount Morris, Mich., died on May 29, 1955. Dr. Schafer was a life member of the Michigan Veterinary Medical Association and had been a member of the AVMA.

Fred A. Stevenson (TH '17), Princeton, Ky., died Oct. 1, 1955. Dr. Stevenson was a general practitioner.

★**Samuel R. Tufts** (EDN '93), 84, Morristown, N. J., died Aug. 31, 1955. Dr. Tufts, who had practiced in Ireland before coming to this country, founded the Morristown veterinary hospital shortly after his arrival and operated it until his retirement in 1948 at which time his son, Dr. Fergus A. Tufts (DUB '44) assumed its management. Dr. Tufts was a member of the New Jersey Veterinary Medical Association and of the AVMA. He is survived by his widow, three sons, five grandchildren, and three great grandchildren.

★**Denny H. Udall** (COR '01), 81, Ithaca, N. Y., died Sept. 9, 1955. An obituary appears on page 551 of this JOURNAL.

John C. Walker (TH '12), 69, Holden, Mo., died April 15, 1955. Dr. Walker was a general practitioner.

Harry Wenborne (OVC '94), Allenton, Wis., died (date not known).

★**Hulbert Young** (UP '00), 77, Baltimore, Md., died Sept. 19, 1955. An obituary appears on page 549 of this JOURNAL.

★Indicates members of the AVMA.

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COMING MEETINGS

Notices of Coming Meetings must be received by 4th of month preceding date of issue

Animal Care Panel. Annual meeting. Henry Hudson Hotel, 353 W. 57th St., New York, N. Y., Dec. 1-2, 1955. Robert J. Flynn, P.O. Box 299, Lemont, Ill., secretary.

Kentucky Veterinary Medical Association. December meeting. Ken-Lake Hotel, Hardin, Ky., Dec. 5-6, 1955. Robert H. Singer, 136 Shawnee Pl., Lexington, Ky., secretary.

Delaware State Veterinary Medical Association. Annual meeting. Lord De-La-Warr Hotel, Wilmington, Del., Dec. 7, 1955. C. A. Woodhouse, Newark, Del., secretary.

American Association of Equine Practitioners. Hotel LaSalle, Chicago, Ill., Dec. 16-17, 1955. J. A. Solomon, 4716 Warrensville Center Rd., Cleveland, Ohio, secretary.

Pennsylvania, University of. Annual conference for veterinarians. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., Jan. 3-4, 1956. M. W. Allam, dean.

Cornell University. Annual conference for veterinarians. New York State Veterinary College, Cornell University, Ithaca, N. Y., Jan. 4-6, 1956. W. A. Hagan, dean.

Ohio State Veterinary Medical Association. Annual meeting. Deshler-Hilton Hotel, Columbus, Ohio, Jan. 4-6, 1956. Mr. R. L. Henry, 50 E. Broad St., Columbus 15, Ohio, secretary.

Oklahoma Veterinary Medical Association. Annual meeting. Hotel May, Tulsa, Okla., Jan. 8-10, 1956. C. H. Fauks, 3421 N.W. 20 St., Oklahoma City, Okla., secretary.

Indiana Veterinary Medical Association. Annual meeting. Hotel Severin, Indianapolis, Ind., Jan. 11-13, 1956. L. M. Borst, 3315 Shelby Ave., Indianapolis, Ind., secretary.

Wisconsin Veterinary Medical Association. Annual meeting. Schroeder Hotel, Milwaukee,

Wis., Jan. 11-13, 1956. B. A. Beach, 1215 Vilas Ave., Madison 5, Wis., secretary.

Tennessee Veterinary Medical Association. Annual meeting. Nashville, Tenn., Jan. 15-16, 1956. H. W. Hayes, 734 Broadway, Northeast, Knoxville, secretary.

Intermountain Veterinary Medical Association. Annual meeting. Hotel Utah, Salt Lake City, Utah, Jan. 16-18, 1956. Edward A. Tugaw, 3015 S. State St., Salt Lake City, Utah, secretary.

Iowa Veterinary Medical Association. Annual meeting. Hotel Fort Des Moines, Des Moines, Iowa, Jan. 17-19, 1956. F. B. Young, Waukee, Iowa, executive secretary.

Virginia Veterinary Medical Association. Annual meeting. Hotel John Marshall, Richmond, Va., Jan. 22-24, 1956. Wilson B. Bell, 210 Clay St., Blacksburg, Va., secretary.

California State Veterinary Medical Association. Midwinter conference. School of Veterinary Medicine, University of California, Davis, Calif., Jan. 23-25, 1956. Charles S. Travers, 3004 16th St., San Francisco, Calif., executive secretary.

Minnesota Veterinary Medical Association. Annual meeting. St. Paul, Minn., Jan. 23-25, 1956. B. S. Pomeroy, School of Veterinary Medicine, University of Minnesota, St. Paul, Minn., secretary.

Maryland State Veterinary Medical Association. Winter meeting. Lord Baltimore Hotel, Baltimore, Md., Jan. 26-27, 1956. John D. Gadd, Cockeysville, Md., secretary.

Oregon State Veterinary Medical Association. Winter meeting. Multnomah Hotel, Portland, Ore., Jan. 27-28, 1956. E. L. Holden, Oswego, Ore., secretary.

(Continued on p. 521)

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Ontario Veterinary Medical Association. Annual meeting. Royal York Hotel, Toronto, Ont., Jan. 27-28, 1956. G. A. Edge, Box 37, Postal Station "F," Toronto 5, Ont., secretary.

Louisiana State University. Annual conference for veterinarians. Louisiana State University, Baton Rouge, Jan. 31-Feb. 1, 1956. W. T. Oglesby, head, Department of Veterinary Science, Louisiana State University, Baton Rouge, La.

Kansas Veterinary Medical Association. Annual meeting. Baker Hotel, Hutchinson, Kan., Feb. 5-7, 1956. K. Maynard Curtis, 70 Central Ave., Kansas City 18, Kan., secretary.

Colorado A. & M. College. Conference for Veterinarians. Glover Veterinary Hospital, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., Feb. 20-22, 1956. O. R. Adams, Department of Veterinary Clinics and Surgery.

Washington, State College of. Annual confer-

ence for veterinarians. College of Veterinary Medicine, State College of Washington, Pullman, Wash., April 2-4, 1956. John R. Gorham, conference chairman.

American Animal Hospital Association. Annual meeting. Hotel Fontainebleu, Miami Beach, Fla., May 23-26, 1956. W. H. Riser, 5335 Touhy Ave., Skokie, Ill., executive secretary.

Maryland State Veterinary Medical Association. Annual summer meeting. George Washington Hotel, Ocean City, Md., June 28-29, 1956. John D. Gadd, Cockeysville, Md., secretary.

Foreign Meetings

World Congress on Fertility and Sterility. Naples, Italy, May 18-26, 1956. Professor T. Bonadonna, Via Monte Ortigara, 35, Milan, Italy, in charge of Veterinary Section.

Tenth International Congress of Entomology. McGill University and University of Montreal, Montreal, Canada, Aug. 17-25, 1956. J. A. Downes, Division of Entomology, Science Service Bldg., Ottawa, Ont., Canada, secretary.

International Association of Hydatidology. Sixth Congress. Athens, Greece, Sept. 14-18, 1956. Prof. B. Kourias, 1 MacKenzie King St., Athens, Greece, general secretary.

(Continued on p. 34)



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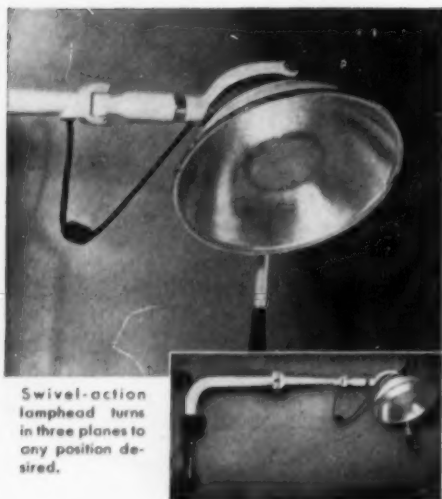
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(COMING MEETINGS—continued from p. 32)

Regularly Scheduled Meetings

Atlanta (Ga.) Veterinary Society, the second Tuesday of every month at the Elks Home on Peachtree St., Atlanta, Ga. J. L. Christopher, Smyrna, Ga., secretary.

Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m. at the Park Plaza Hotel, Charles and Madison St., Baltimore, Md. Harry L. Schultz, Jr., 9011 Harford Rd., Baltimore, Md., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of each month. E. Paul, Redwood City, Calif., secretary.

Cedar Valley Veterinary Association, the second Monday of each month, except January, July, August, and October, at Black's Tea Room, Waterloo, Iowa. D. A. Buchanan, Grundy Center, Iowa, secretary.

Central Alabama Veterinary Association, the first Thursday of each month. G. J. Phelps, Jr., Montgomery, Ala., secretary.

Central Arizona Veterinary Medical Association, the second Tuesday of each month. Keith T. Maddy, Phoenix, Ariz., secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Wilfred Pimentel, 3455 S. Elm Ave., Fresno, Calif., secretary.

Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel in Greensboro, N. Car. R. T. Copeland, 1800 Walker Ave., Greensboro, N. Car., secretary.

Central Indiana Veterinary Medical Association, the second Wednesday of each month. Charles J. York, P. O. Box 1656, Indianapolis 6, Ind., secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month. Mark E. Davenport, Jr., 215 S. Edgewood Ave., La-Grange, Ill., secretary.

Coastal Bend (Texas) Veterinary Association, the second Wednesday of each month. J. Marvin Prewitt, 4141 Lexington Blvd., Corpus Christi, Texas, secretary.

Coon Valley Veterinary Association, the second Wednesday of each month, September through May, at the Bradford Hotel, Storm Lake, Iowa. D. I. Lee, Sac City, Iowa, secretary.

Cuyahoga County (Cleveland, Ohio) Veterinary Medical Association, the first Wednesday of each month, September through May (except January), at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Ed. R. Jacobs, 5522 Pearl Rd., Cleveland, Ohio, secretary.

(Continued on p. 36)

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East Bay (Calif.) Veterinary Medical Association, bimonthly, the fourth Wednesday. John T. Turver, 1201 E. 12th St., Oakland 6, Calif., secretary.

Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December. A one-day clinic is held in May. R. P. Link, College of Veterinary Medicine, University of Illinois, Urbana, Ill., secretary.

Eastern North Carolina Veterinary Medical Association, the first Friday of each month. John D. Baker, Goldsboro, N. Car., secretary.

Fayette County Veterinary Association, Iowa, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Greater St. Louis (Mo.) Veterinary Medical Association, the first Friday of the month (except July and August) at the Sheraton Hotel, Spring Ave. and Lindell Blvd. Allen B. Shopmaker, 136 N. Meramec, Clayton 5, Mo., secretary.

Jacksonville (Fla.) Veterinary Medical Association, the second Thursday of each month, time and place specified monthly. L. D. Barrett, Rt. 8, Box 572, Jacksonville, Fla., secretary.

Jefferson County Veterinary Medical Association (Birmingham, Ala.), the second Thursday of each month. W. R. Laster, Jr., 213 N. 15th St., Birmingham, Ala., secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month, in Louisville or within a radius of 50 miles. Dr. W. E. Bewley, P. O. Box "H", Crestwood, Ky., secretary.

Kansas City Small Animal Hospital Association, the first Monday of each month, at alternating hospitals. W. F. Noland, 7504 Metcalf, Overland Park, Kan., secretary.

Kansas City Veterinary Medical Association, the third Tuesday of each month at Exchange Hall, ninth floor, Livestock Exchange Bldg., 1600 Genessee St., Kansas City, Mo. Busch Meredith, 800 Woodswether Rd., Kansas City 5, Mo., secretary.

Kern County (Calif.) Veterinary Medical Association, the first Thursday evening of each month. B. C. Watson, 825 14th St., Bakersfield, Calif., secretary.

Keystone (Pa.) Veterinary Medical Association, the fourth Wednesday of each month at the University of Pennsylvania School of Veterinary Medicine, 39th and Woodland Ave., Philadelphia 4, Pa. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., secretary.

Kyowva (Ky., Ohio, W. Va.) Veterinary Medical Association, the second Thursday of each month in the Hotel Prichard, Huntington, W. Va., at 8:30 p.m. Harry J. Fallon, 200 5th St. W., Huntington, W. Va.


(Continued on p. 37)

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Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from October through April at the Academy of Medicine, 91 Lincoln Park South, Newark, N. J. Myron S. Arlein, 2172 Milburn Ave., Maplewood, N. J., secretary.

Michiana Veterinary Medical Association, the second Thursday of each month, at the Hotel LaSalle, South Bend, Ind. L. D. Ramsay, 719 E. Jefferson Ave., La Porte, Ind., secretary.

Michigan, Southeastern Veterinary Medical Association, the second Thursday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Road, Detroit 5, Mich., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. George McCollister, 2146 Broad St., San Luis Obispo, Calif., secretary.

Mid-State (Mich.) Veterinary Medical Association, the fourth Thursday of each month with the exception of November and December. Robert E. Kader, 5034 Armstrong Rd., Lansing 17, Mich., secretary.

Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. George F. Lynch, 201 West Devon St., Milwaukee 17, Wis., secretary.

Monterey Bay Area (Calif.) Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 90, Corral de Tierra, Salinas, Calif., secretary.

New Castle County (Del.) Veterinary Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. E. J. Hathaway, Clifton Park Manor, Apt. 73-5, Wilmington 2, Del., secretary.

New York City, Inc., Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Wisneslick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northern Colorado Veterinary Medical Society, the second Monday of each month. M. A. Hammarlund, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday of each month at the Casa Mana in Teaneck, N. J. Edward Baker, 568 Grand Ave., Englewood, N. J., secretary.

(Continued on p. 58)

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Northern San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. Ernest Makino, Patterson, Calif., secretary.

Oklahoma County Veterinary Medical Association, the second Wednesday of every month except July and August. Carl L. Clark, 127 N. W. 23rd St., Oklahoma City, Okla., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month at 8:00 p.m. in Antlers Hotel, San Bernardino, Calif. Jay C. Wallis, 112 N. Girard St., Hemet, Calif., secretary.

Orange County (Calif.) Veterinary Medical Association, the third Thursday of each month. Donald E. Lind, 2643 N. Main St., Santa Ana, Calif., secretary.

Peninsula (Calif.) Veterinary Medical Association, the third Monday of each month. T. D. Harris, San Mateo, Calif., secretary.

Piedmont (N. Car.) Veterinary Medical Association, the last Friday of each month at 7:00 p.m. in Mull's Motel in Hickory, N. Car. W. W. Dickson, Box 1071, Gastonia, N. Car., secretary.

Piedmont (S. Car.) Veterinary Medical Association, the third Wednesday of each month at the Fairforest Hotel, Union, S. Car. Worth Lanier, York, S. Car., secretary.

Pima County (Ariz.) Veterinary Medical Association, the third Wednesday of each month in

Tucson. E. T. Anderson, 8420 Tanque Verde Rd., Tucson, Ariz., secretary.

Redwood Empire (Calif.) Veterinary Medical Association, the third Thursday of each month. Robert E. Clark, Napa, Calif., secretary.

Sacramento Valley (Calif.) Veterinary Medical Association, the second Wednesday of each month. W. E. Steinmetz, 4227 Freeport Blvd., Sacramento, Calif., secretary.

Saginaw Valley (Mich.) Veterinary Medical Association, the last Wednesday of each month. S. Correll, Rt. 1, Midland, Mich., secretary.

San Diego County (Calif.) Veterinary Medical Association, the fourth Tuesday of each month. H. R. Rossoll, 1795 Moore St., San Diego, Calif., secretary.

San Fernando Valley (Calif.) Veterinary Medical Association, the second Friday of each month at Eaton's Restaurant in Studio City, Calif. R. A. Button, 5954 Van Nuys Blvd., Van Nuys, Calif., secretary.

Seattle Veterinary Medical Association, the third Tuesday of each month in the Trinity Episcopal Church, 8th and James St., Seattle, Wash. P. R., Des Rosiers, 5508 2nd Ave. N. W., Seattle 7, Wash., secretary.

Southeastern (Mich.) Veterinary Medical Association,

(Continued on p. 59)



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ciation, the fourth Wednesday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Rd., Detroit 5, Mich., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. E. T. Anderson, Rt. 2, Box 697, Tucson, Ariz., secretary.

Southern California Veterinary Medical Association, the third Wednesday of each month. Howard C. Taylor, 2811 West Olive St., Burbank, Calif., secretary.

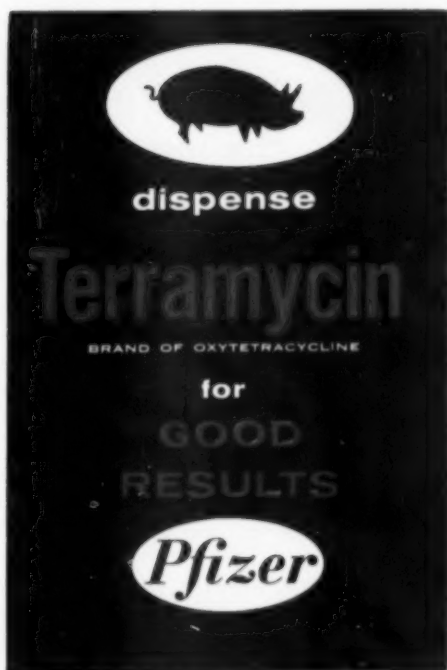
South Florida Veterinary Society, the third Tuesday of each month, at the Seven Seas Restaurant, Miami, Fla. E. D. Stoddard, 6432 S. W. 8th St., Miami, Fla., secretary.

South Puget Sound (Wash.) Veterinary Medical Association, the second Thursday of each month except July and August. Jo Walker, Agriculture Experiment Station, Puyallup, Wash., secretary.

Tenth District (Ind.) Veterinary Medical Association the third Thursday of each month. W. E. Sharp, Union City, Ind., secretary.

Tulare County (Calif.) Veterinarians, the second Thursday of each month. R. B. Barsaleau, 2333 E. Mineral King, Visalia, Calif., secretary.

Tulsa (Okla.) Veterinary Medical Association, the third Thursday of each month in Directors' Parlor of the Brookside State Bank, Tulsa, Okla. Merle S. Watts, 5302 E. 11th St., Tulsa, Okla., secretary.



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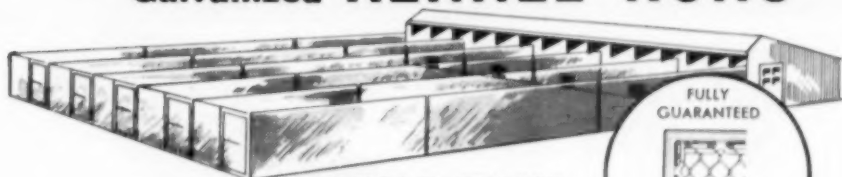
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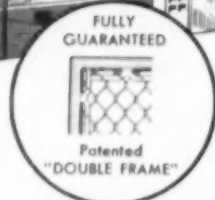
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Wanted—Veterinarians

Graduate veterinary assistant wanted for small animal hospital in Michigan to start about March 1. State qualifications; give complete personal data and salary expected. Address "Box Y 5," c/o **JOURNAL** of the AVMA.

(Continued on p. 42)

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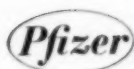


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Veterinarian wanted for Ohio small animal practice; modern hospital. Permanent position; state qualifications and salary expected. Supply references. Address "Box Y 14," c/o JOURNAL of the AVMA.

Veterinarian wanted for Livestock Disease Control State Laboratory in Boise, Idaho. Address Room 206, Statehouse, Boise, Idaho.

(Continued on p. 43)

Old-time, well-established, widely known veterinary supply manufacturer has excellent position for graduate bacteriologist to take complete charge of veterinary biological laboratory. Must have some experience in production of bacterins. Excellent salary and opportunity; permanent position for future advancement. State qualifications, supply experience, and references.
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Graduate AVMA-approved school desires assistantship to general practitioner; prefer Michigan, Wisconsin, Illinois, Indiana, Ohio. Married, 25. Address "Box Y 29," c/o JOURNAL of the AVMA.

(Continued on p. 45)

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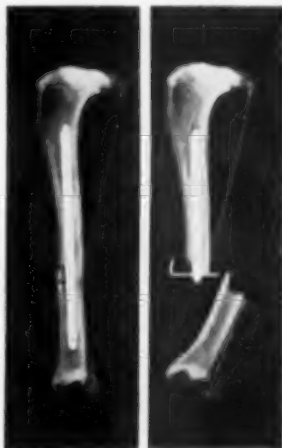
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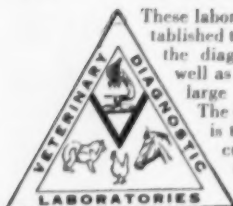
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Veterinarian licensed in New York State and Pennsylvania desires position as assistant in mixed or small animal practice. Address "Box Y 11," c/o JOURNAL of the AVMA.

Iowa graduate desires position leading to partnership or purchase of small animal or mixed practice. Licensed in California. Married, age 31, 10 years' experience. Address "Box Y 13," c/o JOURNAL of the AVMA.

Recent graduate of AVMA-recognized school desires association with small animal practitioner. Veterinarian; available immediately. Address "Box Y 17," c/o JOURNAL of the AVMA.

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(Continued on p. 52)

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They act both medically and mechanically to provide prolonged broad spectrum germicidal activity and gentle non-irritating support to traumatized sphincter and teat mucosa. They promote normal tissue repair with a minimum of altered milking function of the streak canal. Positive retention — fit large or small teats.

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EFFECTIVE WHEN NUTRITIONAL
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1. p/d for Reproduction and Lactation
2. r/d for Obesity Correction
3. i/d for Intestinal Disorders
4. k/d for Nephritic Conditions
5. c/d Special diets for Cats

DISPENSED
ONLY BY
GRADUATE
VETERINARIANS

WRITE FOR INFORMATION ON
THERAPEUTIC FEEDING

(Inquiry form for graduate veterinarians only)

HILL PACKING COMPANY, Box 148, Topeka, Kan.

Send information on therapeutic feeding ☐

Send information on other Hill products ☐

NAME _____

ADDRESS _____

HILL PACKING COMPANY

P.O. Box 148 Topeka, Kans.

Correspondence

Should Generic Names of Drugs Be Used in Veterinary Medical Publications?

Sept. 13, 1955

Dear Doctor Aitken:

At the recent business meeting of the American Society of Veterinary Physiologists and Pharmacologists, approval was given a resolution recommending that the official, generic, or chemical names of drugs be employed in veterinary publications, rather than proprietary or trade names. It was further recommended that this resolution be forwarded to the editors of the several veterinary publications. The text of the resolution reads as follows:

- 1) That the editors of the JOURNAL of the American Veterinary Medical Association and the *American Journal of Veterinary Research* be commended for adopting the nomenclature approved by the Council on Pharmacy and Chemistry of the American Medical Association;
- 2) That the editors of other veterinary publications, including trade journals, adopt the same nomenclature;
- 3) That the members of the Society practice and follow the same nomenclature.

From this it should be clear that the Society goes on record as recommending that the nomenclature of the Council on Pharmacy and Chemistry, American Medical Association, be followed in the veterinary literature. The Council gives preference to official (U.S.P. or N.F.) names, or in the absence of such terminology, a Council-adopted nonproprietary name. The *Journal of the American Medical Association*, and other journals published by this organization, follow the same policy. If a nonproprietary name has not been designated, preference is given to the chemical or generic name, with the trade name following in parentheses.

I have been requested by the Society membership to forward this information to you with the hope that it can be put into practice. Any comments or suggestions you may care to make will be appreciated.

Sincerely yours,

C. M. Stowe, Secretary,
American Society of Veterinary
Physiologists and Pharmacologists.

♦ The three AVMA publications (the JOURNAL, the *American Journal of Veterinary Research*, and the "Proceedings Book") have followed, only in certain instances, the nomenclature approved by the Council on Pharmacy and Chemistry of the American Medical Association. In those instances, the authors used the generic names or the chemical names of the drugs mentioned in their manuscripts. If the authors do not furnish this information, we are unable to follow this procedure.

(Continued on p. 48)

Upjohn

VETERINARY MEDICAL DEPARTMENT
KALAMAZOO, MICHIGAN



*A free-flowing, stable,
oil suspension of
long-acting penicillin,
still the standard for
successful therapy of
strangles, pneumonia,
calf diphtheria, blackleg,
malignant edema,
bovine actinomycosis,
and other infections
caused by penicillin-
sensitive organisms.*

*Detectable blood levels
have been maintained
in many animals for as
long as 96 hours after
a single intramuscular
injection of Depocillin.*

Available in 10 cc. vials.

DEPOCILLIN

300,000 units per cc. (procaine Penicillin G In Oil)

TRADEMARK, REG. U. S. PAT. OFF.

M·A·C



Quick relief for Bone,
Bursal or Tendon Lameness
Single Bottle \$2.00
3 and 1 free 5.00
6 and 2 free 9.00
12 and 4 free 17.00
24 and 4 free 28.00

CARTER-LUFF CHEMICAL CO.
Hudson, N. Y.

CORRESPONDENCE — Continued from p. 46

We have used the ® following the names of drugs which we believed to be registered from the information we had or could obtain, or when the authors so indicated.

We understand that the *Journal of the American Medical Association* has changed its policy of using the ® for registered drugs. The *J.A.M.A.* now capitalizes the names of all drugs when mentioned in manuscripts but does not use the ® (even though the drug is registered). In most instances, it uses the generic names of drugs throughout a manuscript and only uses the trade name the first time the drug is mentioned.—ED.



Mr. Scott L. Barrett, former president, and now chairman of the board, of Fort Dodge Laboratories, Inc., Fort Dodge, Iowa.

SELF FILLING SYRINGE

The multi-injector's third hand



Another accurate smooth working ground glass barrel — leak proof metal plunger instrument with many possibilities. Adjustable for any capacity. By attaching one end of a rubber tube to the self-filling syringe and the other to a bottle of serum or vaccine any number of quick 1/4cc to 5cc accurate dose injections can be made. The instrument is operated with one hand. Anyone who injects a large number of animals will find the Self-Filling Syringe will pay for itself both in labor and serum saved after the first day's use.

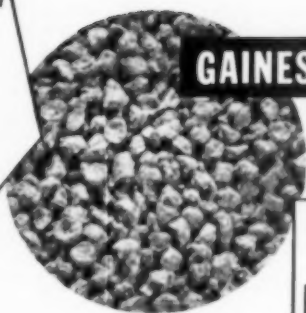
Sizes 2cc and 5cc

Literature upon request

Inquire at your nearest veterinary dealer or wholesaler about this new improved outstanding product.

Boston Instrument Mfg. Co. Inc., 50 Thayer Street, Boston 18, Mass.

**the big
difference
here...**



GAINES MEAL

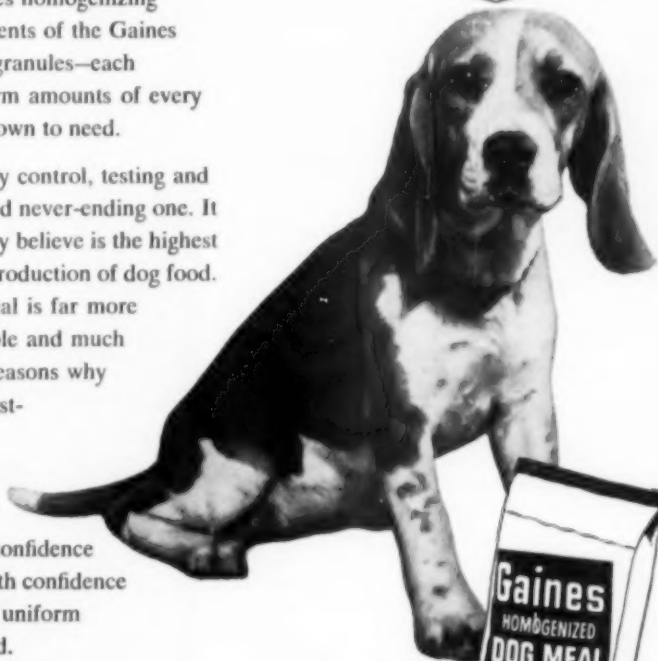
**makes a
big difference
here...**

Yes, Gaines makes the difference

because the special Gaines homogenizing process combines ingredients of the Gaines formula into appetizing granules—each granule containing uniform amounts of every food element dogs are known to need.

Gaines program of quality control, testing and research is an exacting and never-ending one. It results in what we honestly believe is the highest standard possible in the production of dog food. Gaines Homogenized Meal is far more assimilable, more palatable and much easier to feed . . . good reasons why Gaines is America's largest-selling dog meal.

Gaines indeed makes the difference . . .
you can use Gaines with confidence
. . . recommend Gaines with confidence
. . . because complete and uniform nourishment is guaranteed.



A Product of General Foods

Gaines **HOMOGENIZED
DOG MEAL**



POLYOTIC*

Lederle Professional Line

- POLYOTIC*** INTRAMUSCULAR:
100 mg.-500 mg.-1.0 Gm.-5.0 Gm.
- POLYOTIC** INTRAVENOUS:
100 mg.-2.5 Gm.
- POLYOTIC OBLETS**®: 4's-6 x 4's
- POLYOTIC CAPSULES**: 50 mg., 25's-100's;
100 mg., 100's; 250 mg., 16's-100's
- POLYOTIC TABLETS**: 50 mg., 25's-100's;
100 mg., 25's-100's; 250 mg., 16's-100's
- POLYOTIC MASTITIS OINTMENT**: ¼ oz.
- POLYOTIC COMPOUND MASTITIS OINTMENT**: ¼ oz.
- POLYOTIC OPHTHALMIC OINTMENT** 1%:
6 x ¼ oz.
- POLYOTIC TOPICAL OINTMENT** 3%: 1 oz.
- POLYOTIC SOLUBLE (Tinted) POWDER**:
¼ lb.-½ lb.-1 lb.-5 lb.
- AVIANIZED**® RABIES VACCINE (Canine):
1 dose-5 x 1 dose-10 doses
- AVIANIZED RABIES VACCINE** (Cattle): 10 doses
- AVIANIZED CANINE DISTEMPER VACCINE**:
1 dose-10 x 1 dose
- ANTI-CANINE DISTEMPER SERUM AND ANTI-INFECTIOUS
CANINE HEPATITIS SERUM**: 20 cc. 100 cc.
- INFECTIOUS CANINE HEPATITIS VACCINE**: 2 cc.-10 cc.
- BRUCELLA ABORTUS VACCINE**: 1 dose-5 x 1 dose-
5 doses (25 cc.)
- FELINE DISTEMPER VACCINE**: 1 immunization (2 vials
Vaccine, 2 vials Sterile Diluent, 2 cc.)
- ANTI-FELINE DISTEMPER SERUM**: 50 cc.
- CARICIDE**® Diethylcarbamazine TABLETS:
400 mg., 25's
- DIETHYLSTILBESTROL SOLUTION**: 10 cc.-50 cc.
- LEPTOSPIRA CANICOLA-ICTEROHEMORRHAGIAE BACTERIN**
Whole Culture Inactivated Vacuum-Dried.
- Other products to be added.

*Trade-Mark



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AMERICAN CHEMICAL COMPANY

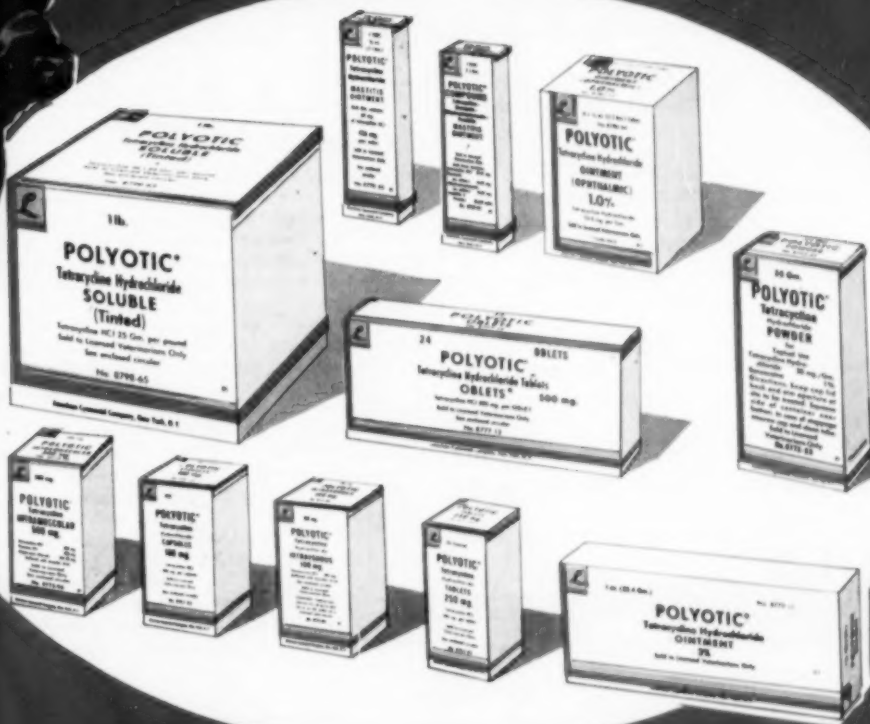
New York



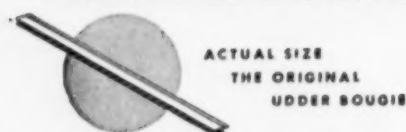
Tetracycline

Here is the newest of the broad-spectrum antibiotics, clinically proved and ready for intravenous, intramuscular, intrasternal, intravaginal, intramuscular, conjunctival, oral and topical use. No other antibiotic is available to the profession only in such a wide variety of dosage forms. No matter what route of administration, there is a **POLYOTIC** designed for proper professional application and for dispensing. Available to Licensed Veterinarians Only.

(Continued)



Compare
PRICE
Compare
RESULTS
and you will always
Prescribe
MASTICS®



MASTICS P&S

100,000 units penicillin
50,000 mcg. dihydrostreptomycin

MASTICS act fast because medication in high concentration is quickly dispersed throughout the quarter. Improvement often noted in 12 hours.

MASTICS contain no grease, no wax, no insoluble materials to remain in the udder retarding antibiotic action. MASTICS milk out completely—produce no residue on the strainer.

MASTICS are so effective, cows are returned to the herd more promptly with less loss of production.

LOW IN COST...HIGH IN POTENCY
MASTICS SAVE TIME, MONEY, MILK

WRITE FOR SAMPLES AND PRICES
The Martin Laboratories
West Chester, Penna.

(CLASSIFIED ADS—continued from p. 43)

Position wanted as lay assistant to veterinarian; will travel anywhere; age 50, 20 years' experience. Large animal work preferred; extensive experience x-raying thoroughbred race horses. Address "Box Y 24," c/o JOURNAL of the AVMA.

Graduate veterinarian, 35, married, desires position leading to partnership, lease or purchase of small animal or mixed practice. Prefer northern California or Nevada. Address "Box Y 26," c/o JOURNAL of the AVMA.

Wanted—Practices

Capable veterinarian, 2 years' experience, wants to purchase mixed practice or to obtain position with a future. Licensed in Pennsylvania, Connecticut, New York. Address "Box Y 7," c/o JOURNAL of the AVMA.

Experienced veterinarian wishes to purchase or lease active small animal hospital in New Jersey. Address "Box Y 3," c/o JOURNAL of the AVMA.

Wanted partnership, lease, or purchase of predominantly small animal practice; age 34, single. Licensed in California and Michigan. Address "Box Y 16," c/o JOURNAL of the AVMA.

Want to buy or lease active small animal hospital in California, Oregon, or Nevada. Will consider partnership. Address "Box Y 18," c/o JOURNAL of the AVMA.

Small animal practice or partnership in Midwest wanted by veterinarian; 10 years' experience. Substantial down payment. Replies strictly confidential. Address "Box Y 25," c/o JOURNAL of the AVMA.

(Continued on p. 54)

Classified Advertisements Will Be Accepted in Research Journal

Beginning with the January, 1956, issue, the *American Journal of Veterinary Research* will accept classified advertisements from graduate veterinarians seeking veterinary technological positions with colleges, universities, and other institutions such as industrial and commercial research laboratories.

Also, classified advertisements will be accepted from institutions and other organizations which may be seeking veterinary bacteriologists, parasitologists, pathologists, or other veterinary technological personnel.

This service is intended to facilitate the placement or finding of personnel with specialized training in veterinary medical science.

The rate for these classified advertisements will be: \$4.50 for the first 25 words and 15 cents for each additional word. No charge will be made for the use of a box number.

The closing date for classified advertisements in the *A.J.V.R.* (a quarterly) is the 24th of the month preceding date of issue—for example, December 24th for the January, 1956, issue.



for dispensing and use by veterinarians only

for prevention and treatment of disease . . .

Terramix-5

5 Gm. of oxytetracycline hydrochloride (Terramycin®) activity per lb.

Terramix-10*

10 Gm. of oxytetracycline hydrochloride (Terramycin®) activity per lb.

... the growth-promoting, nutrition-enhancing, disease-preventing and therapeutic activity of Terramycin® in a form easy to dispense and easy to administer . .

... these products blend readily into the livestock and poultry rations (grain, silage, or mash), and can conveniently be incorporated in pre-mixes.

*in the
NEW 5-lb.
re-usable
dispensing
canisters
with removable
labels*



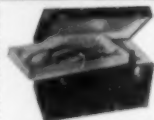
Pfizer

Department of Veterinary Medicine
PFIZER LABORATORIES, Brooklyn 6, N. Y.
Division, Chas. Pfizer & Co., Inc.

*Trademark



veterinary equipment news



durable, metal sheathed instrument/serum cases

Baked black enamel over steel with brass trim. 5 standard models; light weight, yet built to take knocks! See folder N-1 for sizes, prices.



new do-it-yourself Plasti-Plated cages

Before you buy cages, write for folder N-2 on our amazing new Plasti-Plated kennels. Rock-hard, glass-smooth, seamless surfaces. Inexpensive, easy to do-it-yourself!



electric "B" dairy cow branding iron

Heats in 90 seconds, makes a clean brand, weighs only 11 ounces. T and V brands available too. Uses 110 v. current, won't smoke. Write for folder N-3.



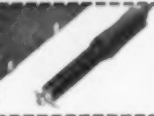
new! clear plastic cases for your glass syringes

Keep syringes sterile, clean in these light, unbreakable plastic cases. Covers for 5, 10 and 20 cc. syringes, \$5.75 set, folder N-4 gives details.



new! plastic sign letters for your hospital

Our new selection of beautiful weatherproof plastic signs will dress-up your office or clinic. All sizes, colors; easily installed. Write for folder N-5.



hi-current electric firing iron

Most modern, up-to-date way to fire horses, remove warty growths, ear polyps, tumors. Complete with 11 points/tips. Write for folder N-6.

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|--|---|---|
| <input type="checkbox"/> folder N-1
cases | <input type="checkbox"/> folder N-2
Plasti-Plate | <input type="checkbox"/> folder N-3
"B" irons |
| <input type="checkbox"/> folder N-4
syringe cases | <input type="checkbox"/> folder N-5
sign letters | <input type="checkbox"/> folder N-6
firing irons |

Please send me the folders I've checked above.

DVM

street

city

Nicholson Manufacturing, Inc.
2440 East Third Avenue Denver 6

clip and mail today

(CLASSIFIED ADS—continued from p. 52)

For Sale or Lease—Practices

Mixed practice for sale in Midwest city of over 15,000. Grossing \$18,000-\$20,000 annually; 90% large animals; testing available. Includes modern downtown office, complete drugs, equipment, x-ray, etc. Address "Box V 14," c/o JOURNAL of the AVMA.

Fabulous Las Vegas — established practice priced to sell; excellent opportunity. License through reciprocity possible. Address Dr. Alfred Bernkrant, 1800 S. Main St., Las Vegas, Nev.

Remittance must accompany advertisement

What offers for large, well-established veterinary practice in central Alberta on main highways midway Calgary—Edmonton. Good supply of drugs and instruments; compulsory semiannual calfhood vaccination. House containing office and attached garage. Terms to be arranged. Address "Box Y 28," c/o JOURNAL of the AVMA.

(Continued on p. 56)



.. because they went to their doctors in time

Many thousands of Americans are being cured of cancer every year. More and more people are going to their doctors in time.

But the tragic fact, our doctors tell us, is that every third cancer death is a needless death... twice as many could be saved.

For the facts of life about cancer, call the American Cancer Society office nearest you or write to "Cancer" in care of your local Post Office.

American Cancer Society





*the meal
that's
made by
meat men!*



**IT'S CONDENSED!
FEED UP TO 25% LESS!**

Now Pard Meal is so rich in concentrated feed value that, pail for pail, you feed less... up to 25% less than with other dry-type meals. Ask your Swift man to show you a comparative feeding chart.



**Swift's Pard Meal contains up to 50%
more meat fat than any other leading meal!**

● Our business is meat. Because we put more *into* Pard Meal, you get far more value out of using it. Extra amounts of rich beef fat mean greater flavor and nutrition... healthier, better-fed dogs. And Pard Meal is the most complete dry meal on the market. It's so rich in

concentrated food value you can *feed less* than with other dry-type meals! NOW AVAILABLE IN BOTH FLAKE AND CRUMBLE TEXTURES—25 or 50-lb. bags.

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U. S. Yards • Chicago 9, Illinois



Pard is Swift's famous canned dog food... made with that **GOOD BEEF TASTE** dogs love. There's as much nourishment in one can as there is in a *human* dinner of roast beef, green beans and mashed potatoes. You can recommend nothing better.

FUNGASARC

**for the effective treatment
of skin conditions**

Destroys fungi; sarcoptes scabiei canis; demodex canis; mites; fleas; lice. Repels ticks. Non Staining; not greasy; has no objectionable odor, destroys odors of external origin. Non Toxic; may be used daily in recommended dilution. Concentrated; one gallon makes four.

Gallon

\$13.95

Makes 4 gallons

Quart

\$4.00

Makes a gallon

**Available nationally through
well known Distributors**

Write for free sample

Oscro Chemical Company, Inc.

**1843 Cheshire Bridge Road, N.E.
Atlanta 1, Georgia**

(CLASSIFIED ADS—continued from p. 54)

Established general practice for sale in central Iowa, on main highway. New ranch-style house, office attached; \$12,000 down; sell for inventory, less than one year's gross. Address "Box Y 2," c/o JOURNAL of the AVMA.

Established small animal hospital for sale in New Orleans, with or without equipment. Price, one-third yearly gross; terms. Address "Box Y 6," c/o JOURNAL of the AVMA.

Established veterinary practice, small animal hospital, and boarding kennels for lease in suburban Denver. For particulars address Mrs. Harold F. Newton, Box 233, Adams City, Colo.

Modern small animal hospital on main boulevard for sale or lease in Los Angeles suburb; 5-year-old building on large lot; \$5,000 can handle. Address "Box Y 19," c/o JOURNAL of the AVMA.

Small animal practice for sale in metropolitan Delaware; real estate and all equipment; choice location and clientele. Priced at gross income of the year; low down payment; long-term purchase plan. Address "Box Y 20," c/o JOURNAL of the AVMA.

Modern small animal hospital for sale or lease near San Francisco; long-established, excellent practice. Good terms. Address "Box Y 21," c/o JOURNAL of the AVMA.

(Continued on p. 58)

**FOR
DERANGED
LIPID
METABOLISM...**

LECIPET

**The Complete Lipotropic
Diet Supplement for Dogs**

- Restores healthy hair and skin
- Improves breeding performance
- Rejuvenates older animals
- Safeguards health during lactation



In Ontario: F. T. Freeman
3 Newton St. Barrie

ASSOCIATED CONCENTRATES

57-01 32nd Avenue, Woodside 77, N.Y.

New Book on Photography Available

Camera fans, especially those who are pet enthusiasts, have a pleasant surprise in store for them—from Puss 'n Boots Cat Food. A new 36-page book by Walter Chandoha, noted photographer of pets, entitled "How to Photograph Your Cat," is full of professional hints on how to pose cats, how to take close-ups of "magazine-cover quality," how to be sure home movies really "move," and many other subjects. And there's a chapter on color shots that alone can save the amateur many times the cost of the book. In addition to the "dos" and "don'ts" covered in the text, there are 12 explanatory sketches and 23 original Chandoha photos.

"How to Photograph Your Cat" may be obtained by sending three Puss 'n Boots labels with 25 cents to cover mailing and handling costs to Puss 'n Boots, Box 364, Times Square Station, New York 36, N.Y.

Chlorophyll Deodorization.—When the lesions of 27 human patients with advanced carcinoma of the head and neck, which produced objectionable odors, were alternately treated with copious sprayings of a chlorophyll solution six times a day for a week, then with a placebo, no significant differences in the odor could be detected.—*J.Am.M.A.*, April 9, 1955.



A machine designed for any veterinarian, whereby no experience is needed in order to grind clipper blades and shears.

No more waiting for your blades to be sent away to other cities for sharpening. In a matter of minutes you can sharpen your blades, at your convenience.

Easy to Use

- Remove blade from clipper. • Place on machine

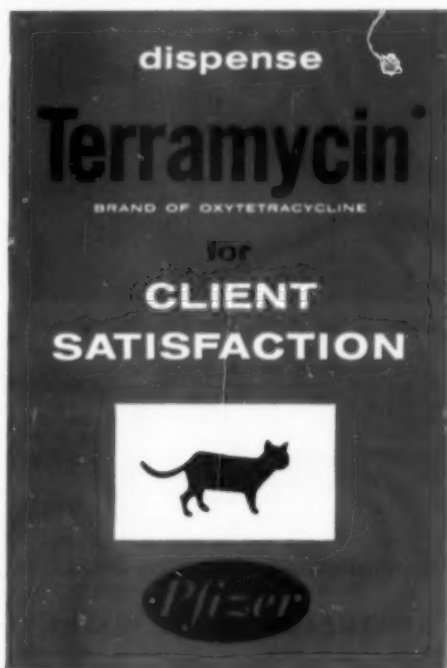
THAT'S ALL You can never oversharpen a blade

Each machine guaranteed for 1 year

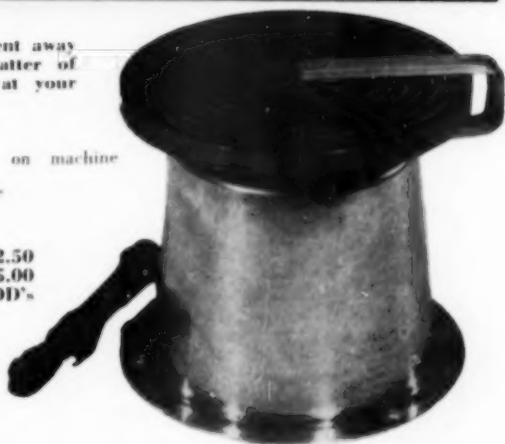
Price:	East of Miss. River	\$32.50
	West of Miss. River	35.00
	Freight Prepaid.	No COD's

For further information, write us today.

SUN RAY
HAIR PREPARATIONS CO.
NEW YORK 61, N. Y.



CLIPPER BLADE & SHEAR GRINDER





RIVERSIDE ALL STEEL KENNELS—QUALITY FIRST

MANUFACTURED IN 5, 7, AND 8, CAGE UNITS. EQUIPPED WITH BALLBEARING CASTERS AT NO EXTRA COST. MINOR CHANGES IN DESIGN OPTIONAL. SLIDING PANELS BETWEEN CAGES IF DESIRED. STEEL-BARRED DOORS AND ESCAPE-PROOF LATCHES. NEW TYPE DOOR FRAMES WILL NOT COLLECT DIRT. VENTILATING STRIP IN LOWER CAGES GALVANIZED STEEL USED.

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Descriptive Literature

LOW EASY TERMS MAY BE ARRANGED IF DESIRED

A lifetime of service and guaranteed by one of California's oldest iron works.

RIVERSIDE IRON WORKS

5422 Mission Blvd.

Riverside, California

(CLASSIFIED ADS—continued from p. 56)

Miscellaneous

Complete clinic equipment for sale; very reasonable. Veterinarian deceased. Address C. A. Hillbrand, 4342 Woodcrest Drive, Memphis, Tenn.

For sale—In Minnesota, a 2-way Motorola radio including transmitter, mobile unit, remote control, 2 microphones, antenna, metal tower, adapter kit. Original cost including installation, \$1,900. Frequency, 37.98; used 9 months. Price, \$1,250. Address "Box Y 8," c/o JOURNAL of the AVMA.

For sale—small animal mouth speculum. Used primarily to pass the stomach tube in dogs and cats; self-retaining, made of life-lasting plastic. Instructions included. Set of 2, \$6.00. J. & G. Mfg. Co., 1585 Moore St., Akron 1, Ohio.

Clipper Blade Sharpening—guaranteed to please you; factory trained. Our customers recommend us; 1,000 satisfied veterinarians. Avoid C.O.D., send money with blades, 75c per set; 24-hour service. Service Grinding Co., 903 Chicago St., Racine, Wis.

Pregnancy Diagnosis—in mare from 45th to 150th day. Write for vials and mailing tubes. Price: \$7.00; 2 or more tests, \$6.00 each. Pregnancy Diagnostic Laboratories, H. S. Lames, D.V.M., Dysart, Iowa.

Breeders' Sleeve—the disposable obstetrical sleeve. Package of 20 with detachable chest band, \$5.00; lower wholesale prices. Free sample upon request. Breeders Equipment Co., Flourtown, Pa.

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really saves me work . . .

In just minutes, I get a complete financial picture of my practice
 . . . day by day . . . every day.

See for yourself what a work-saver Histacount is
 . . . mail the convenient coupon today . . . no obligation.

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PROFESSIONAL PRINTING COMPANY, INC.
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Gentlemen: Please send free Histacount Bookkeeping samples and literature, no obligation on my part.

Dr. _____

Address _____

*An important
new idea in
Distemper-Hepatitis
Immunization*



Sin-jex is the first Distemper-Hepatitis vaccine to utilize a vacuum dried *modified live virus* distemper fraction, with killed virus hepatitis fraction as diluent. *Sin-jex* gives more positive immunity against distemper: because the modified live virus distemper fraction elicits a more marked immunity response. *Sin-jex* is instantly reconstituted because of the R_L "reconstit-quick" feature. *Sin-jex* is a fine homogenous suspension which passes easily through a 22 gauge needle. *Sin-jex* is easily administered with a single subcutaneous injection. *Sin-jex* may be given simultaneously with or without Anti-Canine Distemper-Infectious Hepatitis Anti-Serum. *Sin-jex* produces immunity in less than two weeks. *Sin-jex* may be used before or after weaning.

Research Laboratories, Inc.
St. Joseph, Missouri

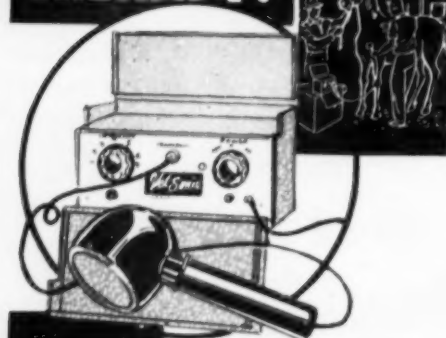
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INDEPENDENT ETHICAL DISTRIBUTORS
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KEEP PACE WITH PROGRESS-

USE Vet Sonic

**FOR
ANIMAL
THERAPY!**



VETSONIC is the scientific application of ultrasonic therapy for veterinary purposes. Medicine has taken on a new tool in the last decade

— THE ULTRASONIC FIELD!

VETSONIC, embodying the principles of ultrasenics, is being made available to the practicing veterinarian with the knowledge that the therapeutic action of ultrasonics which is being so successfully utilized in the medical practice is a valuable adjunct in the treatment of animals. **VETSONIC** is designed specifically for animal use . . . a new physical tool for the veterinarian in his everyday practice. Write today for the brochure "A New Approach to Animal Therapy."

Exclusive Distributors
WILBUR RICE ASSOCIATES INC.
430 S. Kenilworth Ave. Oak Park, Illinois

Some Animals Are Left-Handed

When cats were tested at Oxford University in England by seeing which paw they would use in grasping a piece of meat in a glass tube at an increasing distance from the open end, 20.0 per cent proved to be right-handed, 38.8 per cent left-handed, and 41.7 per cent were ambidextrous. A certain paw had to be used 75 times in 100 reaches to be conclusive. Parrots also are left-handed while right-handedness is most common in man. Rats, monkeys, and chimpanzees are in between.—*Sci. News Letter*, May 14, 1955.

Flies lose their resistance to DDT in eight months if they have not had contact with it during that time.—*Du Pont Agric. News Letter*, July, 1955.

**You can't
beat
WAYNE**

for **EASY
ECONOMICAL
FEEDING**



Take the work out of raising puppies. Use this easy self-feeding method with the economical all-in-one **WAYNE DOG FOOD**! Complete high-energy formula gives you simplified feeding. No extras needed.



Valuable
coupons on
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WAYNE DOG FOOD

ALLIED MILLS, INC., Dog Food Division, Ft. Wayne, Ind.

The Hand of INTEGRITY...



Produced for exclusive use
of the Graduate Licensed
Veterinarian

MEMBER: Associated
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Laboratories, Inc.

AFFILIATED . . . a new name, but one founded with the same basic business principles as Grain Belt Supply Company. The complete Affiliated line meets the same rigid standards that have been applied to Grain Belt products for over 35 years. Veterinarians may place the same confidence in Affiliated products that they have expected from the Grain Belt Supply Company. Affiliated, too, is produced for the exclusive use of the Graduate Licensed Veterinarian. • The Grain Belt Supply Company, which has served you faithfully for many years, is proud to take part in bringing you the new Affiliated line.

GRAIN BELT SUPPLY COMPANY
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THE ANIMAGRAPH (Latest Model)
MAKE SURE THE X-RAY MACHINE YOU BUY REFLECTS
SOME THOUGHT OF THE VETERINARIAN IN ITS DESIGN

Use This
Coupon.

61

X-RAY ANIMAGRAPH

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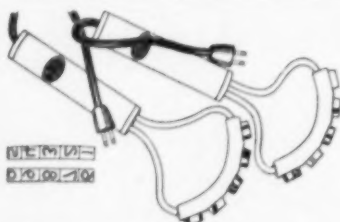
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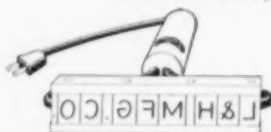
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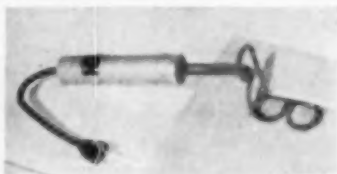
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Index to Advertisers in This Issue

Abbott Laboratories	13
Affiliated Laboratories	23
Albany Serum Company	36
Allied Mills	60
Armour Veterinary Laboratories	26, 35
Arnold Laboratories	7
Arnold & Sons Veterinary Instruments	38
Ashe Lockhart	3rd cover
Associated Concentrates	56
Boston Instrument Mfg. Co., Inc.	48
Campbell X-Ray Corp.	61
Carter Luff Chemical Co.	48
Clipper Service	30
Corn States Laboratories, Inc.	2nd cover
Curtis Laboratories	45
Diamond Laboratories	33
Drugs for Veterinary Medicine, Inc.	20
Ellfield Laboratories	21
Ethical Veterinary Supply Co.	37
Ford Kennel Equipment	39
Fort Dodge Laboratories, Inc.	5, 28
Friskies Dog Foods	25
Fromm Laboratories, Inc.	31
Gaines Dog Foods	49
Grain Belt Supply Company	61
Hamilton Pharmacal, Inc.	40
Haver-Glover Laboratories	64
Hill Packing Company	46
Jackson, Dr. S.	10
Jensen-Salsbery Laboratories, Inc.	42, 43, 4th cover
Journal of Parasitology	62
Kirschner Manufacturing Company	12
Lederle Laboratories	50, 51
MacAllan Laboratories	43
Martin Laboratories	52
Massengill Company, S. E.	14, 15
National Laboratories Corporation	16
Naylor Co., H. W.	45
Nelson Laboratories	62
Nicholson Manufacturing, Inc.	54
Norden Laboratories	1
Nutritional Research Associates	32
Osco Chem. Company, Inc.	56
Parke, Dav. Company	29
Pfizer Laboratories	24, 39, 41, 42, 53, 57, 62
Pitman-Moore Company	3
Professional Printing Company, Inc.	58
Professional Products Co.	17
Publishers' Authorized Bindery Service	63
Puss 'n Boots Cat Food	11
Research Laboratories, Inc.	59
Rice Associates, Wilbur	60
Riverside Iron Works	58
Sani-Cage Distributing Co.	32
Sharpe & Dohme, Div. Merck & Co., Inc.	18
Servall, Inc., Ivan	44
Sunbeam Corporation	40
Sun Ray Hair Preparations Co.	57
Swift and Company	55
Syrco Products	22
Upjohn Company	47
Veterinary Diagnostic Laboratories	44
Vitamineral Products Company	27
Wallace & Tiernan, Inc.	30
Warren Teed Products Co.	9
Williams & Wilkins Company	6
Wilmot Castle Co.	34
Winthrop Laboratories Inc.	19

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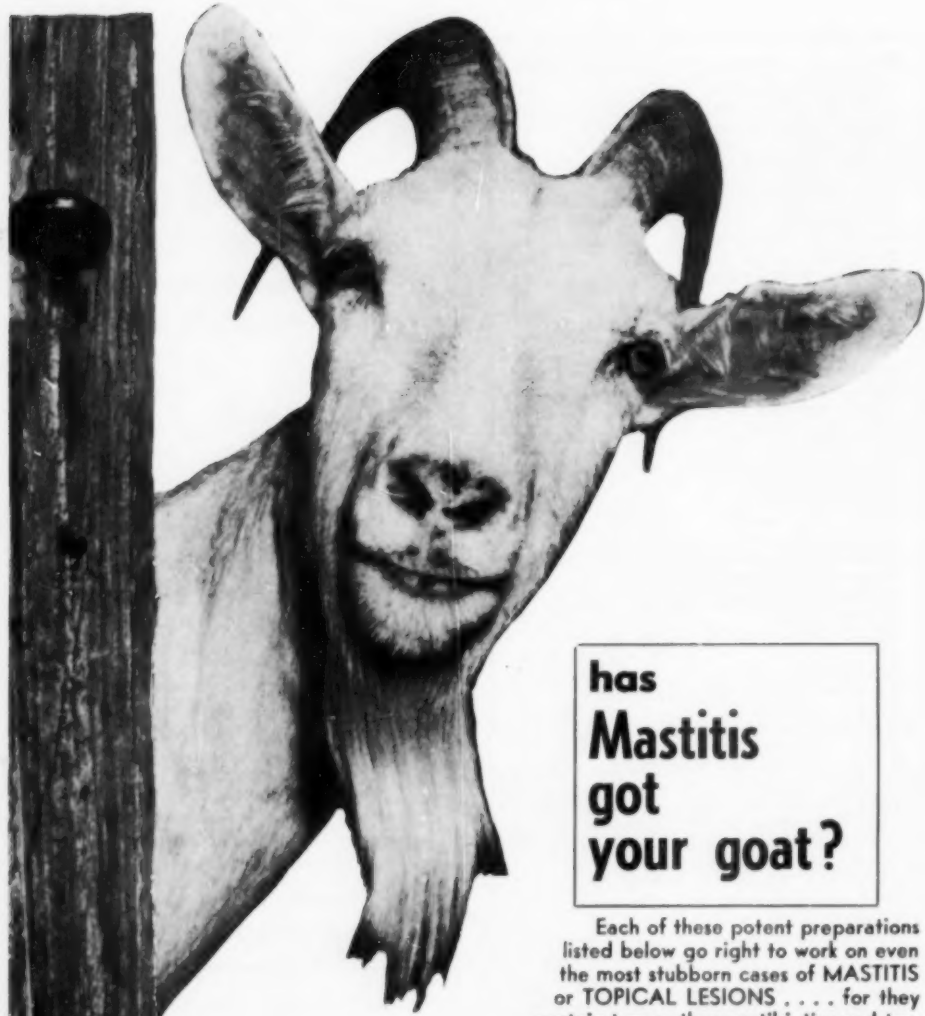
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